Operating Instructions

Mobicat

MC 125 Z + ZS

PLC

Please keep for future use!

Product information

Model	Mobicat
Type	MC 125 Z + ZS
Commission number	3074999/907-2679
Order number	4071974
Year of manufacture	2008

Customer entries

Inventory no.

Location

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Operating instructions document number: 4071974

Purpose of the document

The purpose of these operating instructions is to provide information on all important issues relating to the technical design and safe operation of your machine.
Like us, you are also required to give close attention to these operating instructions prior to commissioning. This is necessary to operate your machine economically and to avoid damages and injuries. Unfortunately we cannot accept any liability for faults and damages that can be attributed to inadequate knowledge of the operating instructions.
In cases of doubt, please contact our inhouse consultants or our branches and dealers both at home and abroad. We will be delighted to provide you with further assistance.

Organisation of the operating instructions

The operating instructions are divided into chapters, which deal with the various types of machine application. This division will make it easy for you to find the desired information.

Additional documents

In addition to these operating instructions, the original operating instructions must be used for certain vendor parts. We wish to expressly state at this point that these original operating instructions must be used with care. Although these operating instructions are designed for the relevant component, deviations in placement and functioning can occur as a result of installation in the system

The following original documentation is also provided:

Operating instructions for power unit	**2x**
Operating instructions for motor monitoring unit	**2x**
Circuit diagrams for electrical control system	**2x**
Functional description for electrical control system	**2x**
Operating instructions for magnetic belt separator (option)	**1x**
Operating Instructions for magnetic belt separator rectifier (option)	**1x**
Operating instructions for radio remote control (option)	**1x**
Operating instructions for frequency converter (option)	**2x**

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1 Product description

1.1 Application and intended use

The MC 125 ZS mobile crusher plant is solely intended for use in crushing middle-hard stones, minerals and rubble with a crushing strength of 300 N/mm² (43,500 lbs/in²) and a max. feed size of 1200 x 900 mm (47 in x 35 in).

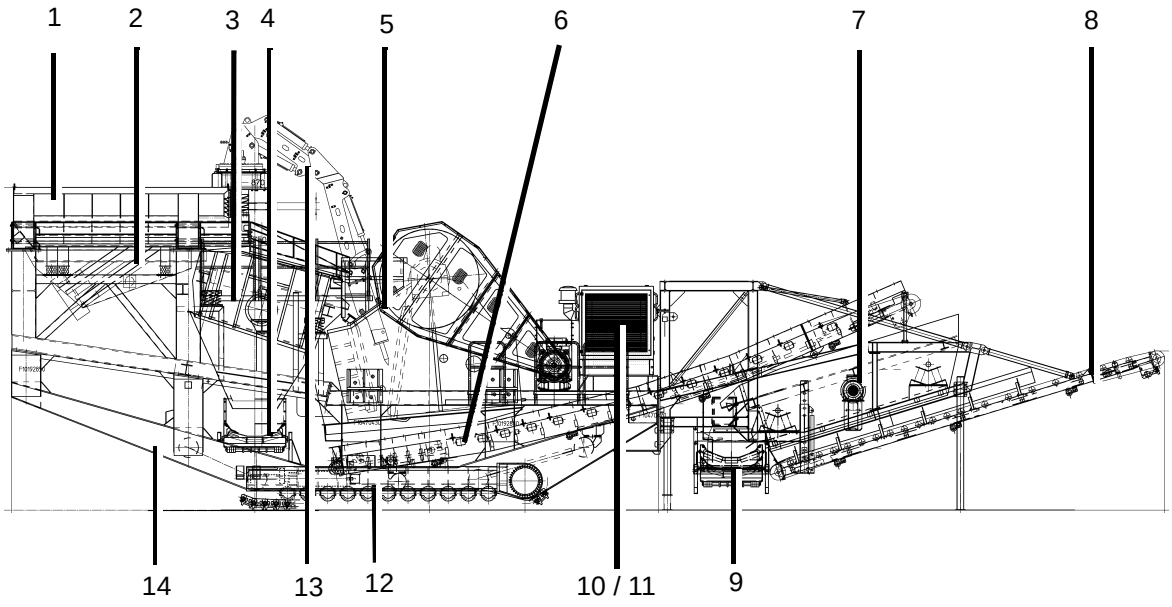
Any further use, such as the crushing of contaminated materials, wood, scrap, coal, metal parts, etc., is contrary to the intended use of the machine.

The manufacturer does not accept responsibility for any resulting damage. The user alone bears the risk.

Included in the intended use:

- adherence to all instructions in the instruction manual and
- performance of inspection and maintenance work.

1.2 Machine overview



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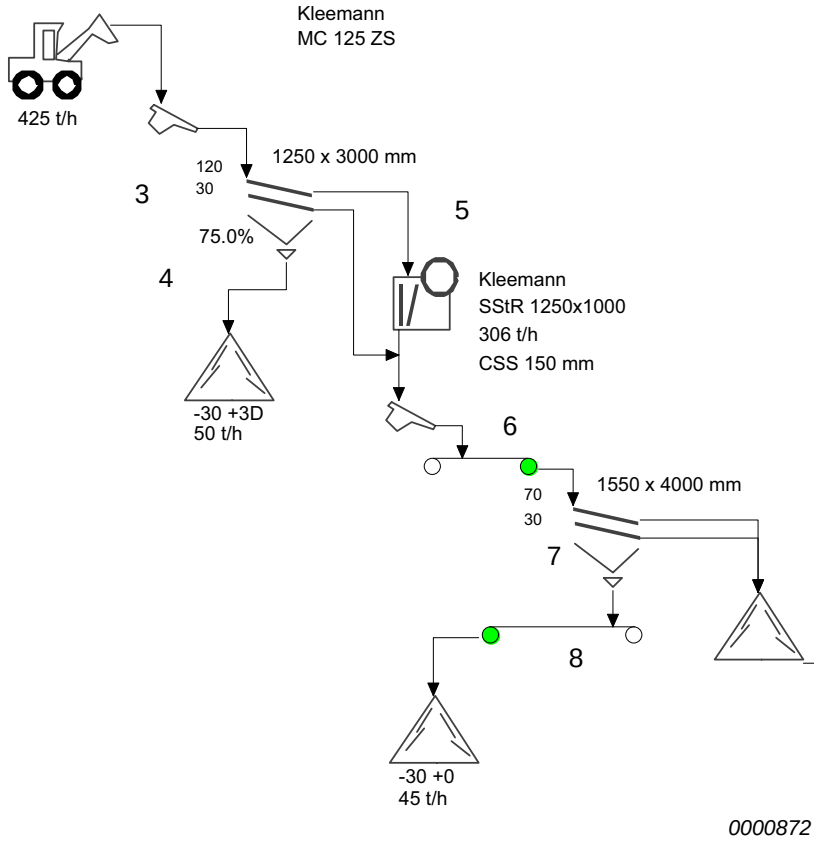


1	**Feed hopper**	**9**	**Side discharge conveyor**
2	**Vibrating feeder trough**	**10**	**Diesel hydraulics of entire drive** unit
3	**Vibrating screen**	**11**	**Diesel generator**
4	**Side discharge conveyor**	**12**	**Crawler running gear**
5	**Single toggle jaw crusher**	**13**	**Rock chisel**
6	**Vibrating discharge trough**	**14**	**Chassis**
7	**Vibrating screen (classifying)**	**15**	**Electrical control (not displayed)**
8	**Belt conveyor for discharge of finished products, classifying screen**		

1.3 Precautionary measures

In the event of incorrect use of the plant, improper operation or faulty repairs, the plant itself or products located nearby may be damaged or destroyed. Persons who are in the hazard area are liable to

incur severe or fatal injuries.

Thus this instruction manual must be read thoroughly and it is imperative to observe the relevant safety instructions.

1.4 Conformity

The plant corresponds in its setup to valid EC Directives, as well as appropriate European standards. The development, manufacture and installation of the plant has been carried out with the utmost care.

1.5 Product designation

As the plant contains various individual machines, several type plates are used for the designation and these are found on the respective individual machines.

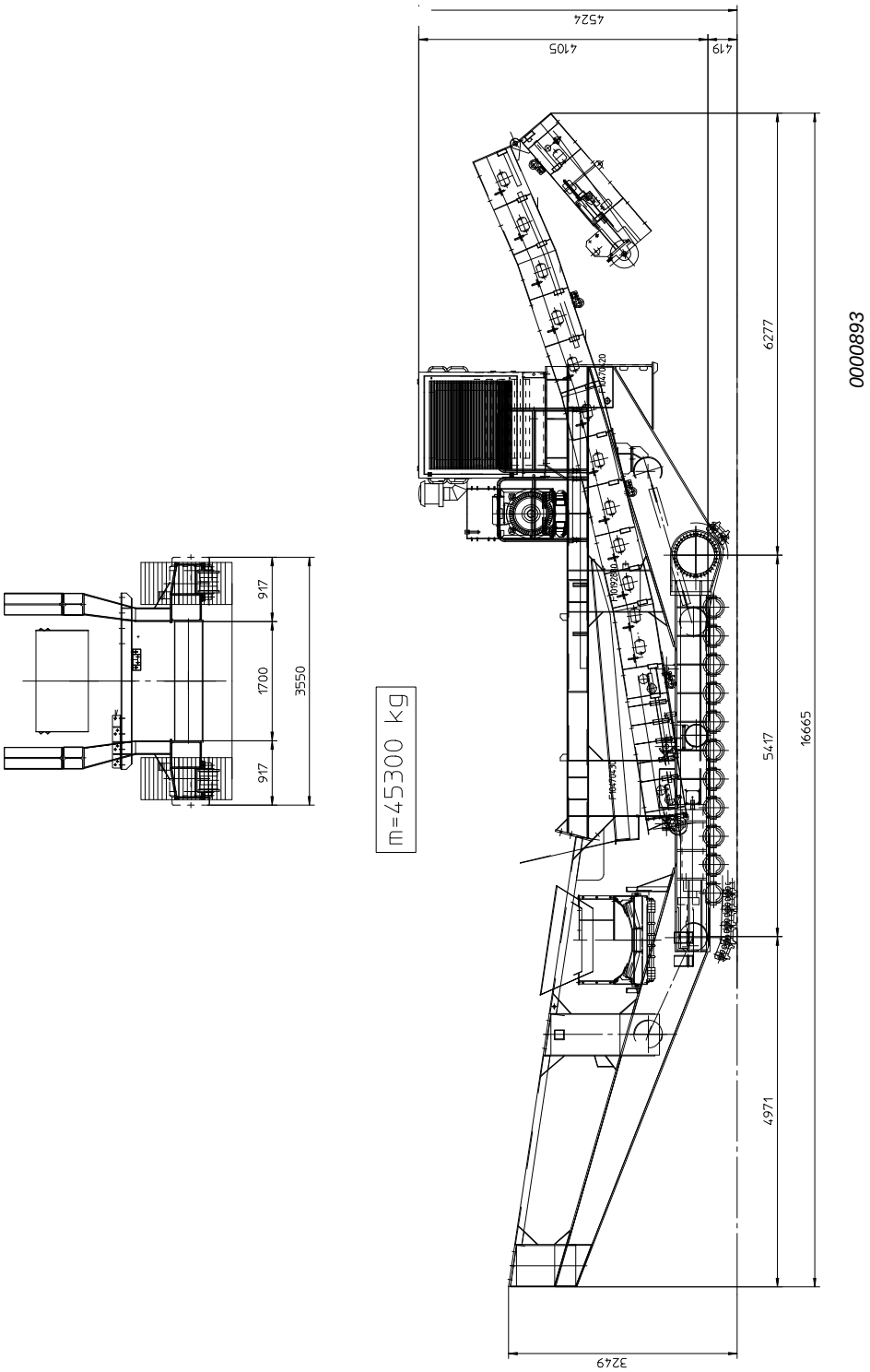
1.6 Technical details

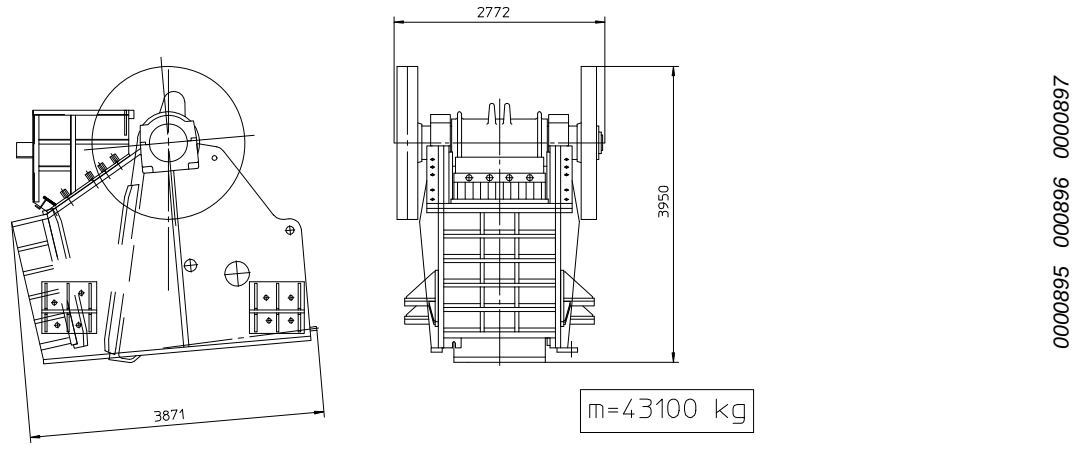
All important technical details regarding the entire plant are given. These provide information on the performance and installation of the plant.

1.6.1 Mobicat plant

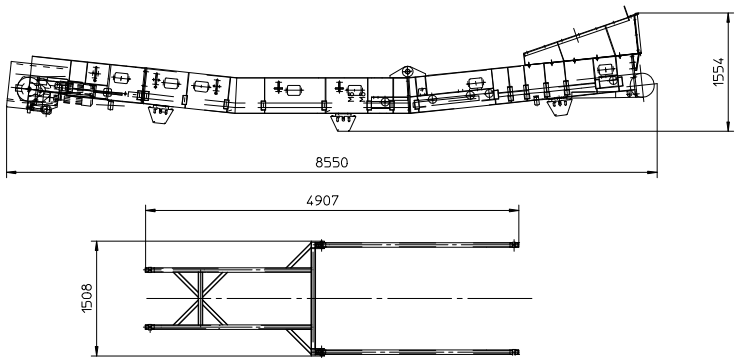
Charged material	Rubble, demolished concrete, natural stone
Feed size	Depending on the charged material up to 1200 x 900 mm (47 in x35 in) in profile
Feed capacity	Up to 600 t/h (671 sh tons) depending on the charged material, primary screening and final grain size
Crushing capacity	Approx. 240-310 t/h (264-341 sh tons) with gap width of 130 mm (5.12 in) Approx. 290-370 t/h (319-407 sh tons) with gap width of 150 mm (5.91 in)
Total weight	145,000 kg (320,000 lbs)
Emissions	Noise, dust
Surface load	
Driving speed	

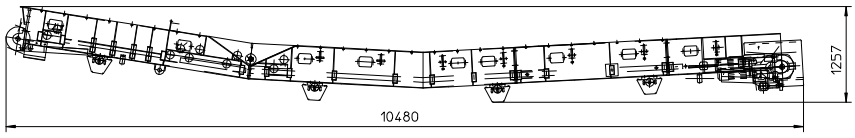
1.6.2 Transport and erection area



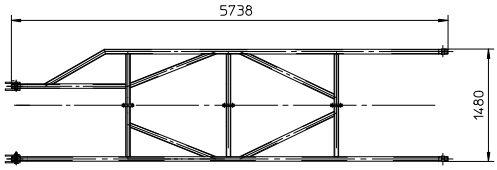

2772
3950
3871
m=43100 kg
0000895 000896 0000897
2750
3409
6994
2500
m=17778 kg
m=16000 kg
2533
4140
8839

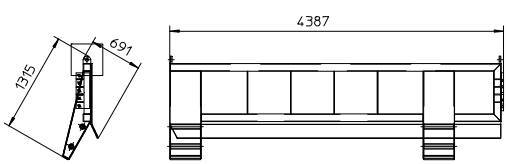
m=2600 kg
BB 1200 AA 9,0m



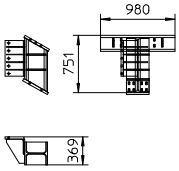


3250 kg
BB 1000 AA 10,0m





2x m=890 kg



2x m=260 kg

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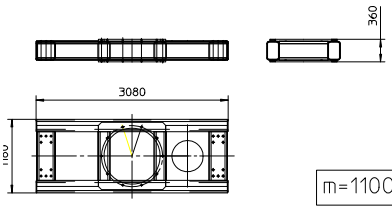
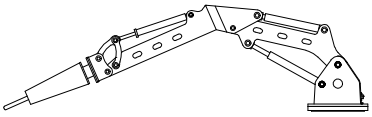
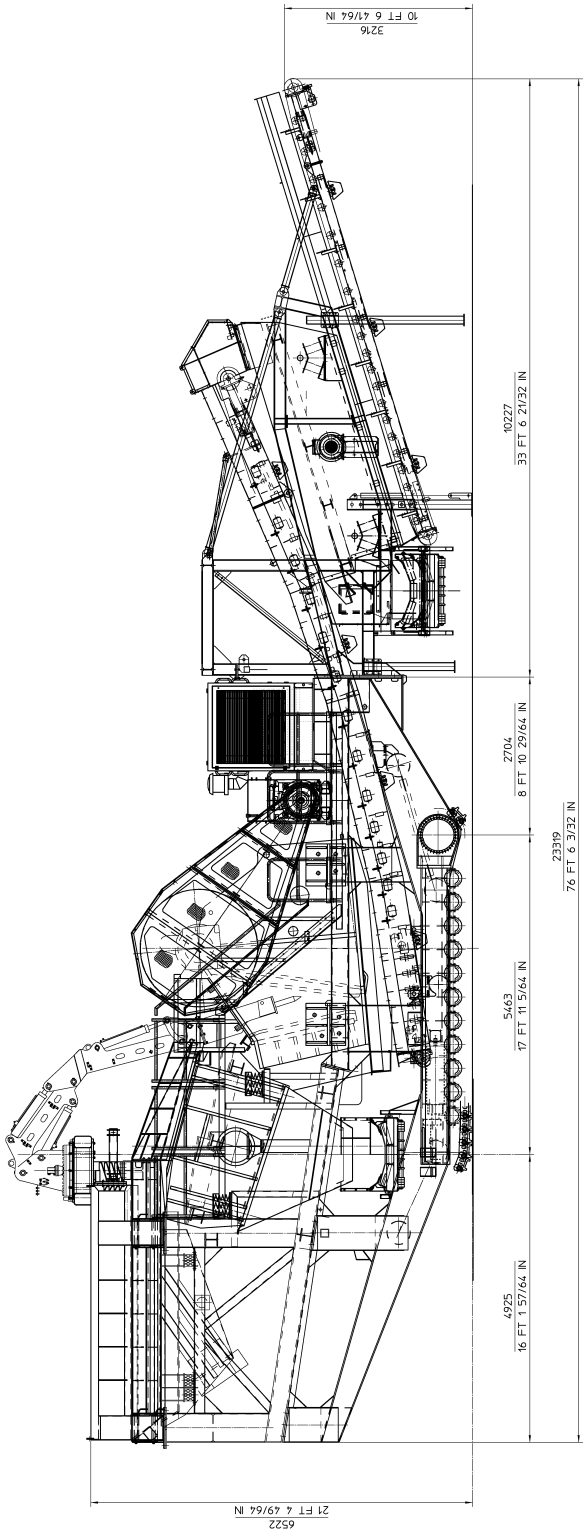


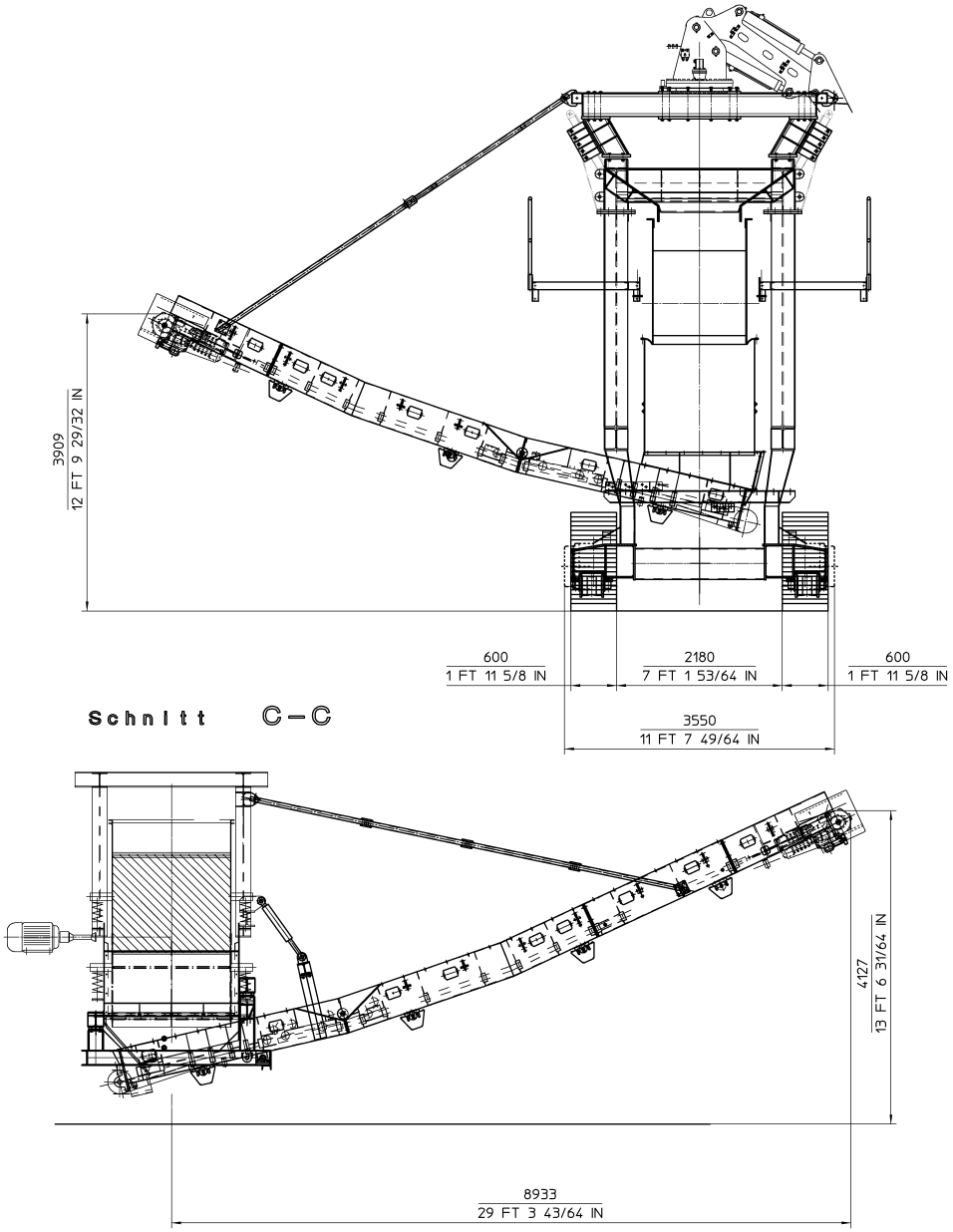
m=1100 kg



Felsmeissel m=5400kg
L x B x H = ca.8500 x ca.1450 x ca.2550


3276
10 FT 6 47/64 IN
10227
33 FT 6 21/32 IN
2704
8 FT 10 29/64 IN
23319
76 FT 6 3/32 IN
5463
17 FT 11 5/64 IN
4925
16 FT 1 57/64 IN
6522
21 FT 4 49/64 IN

0000901


3909
12 FT 9 29/32 IN
600
1 FT 11 5/8 IN
2180
7 FT 1 53/64 IN
600
1 FT 11 5/8 IN
3550
11 FT 7 49/64 IN
Schnitt C – C
4127
13 FT 6 31/64 IN
8933
29 FT 3 43/64 IN

0000902

2 Safety regulations

2.1 General

Knowledge of the essential safety instructions and safety regulations is a basic prerequisite for the safe use and trouble-free operation of the machine.

The safety instructions in this section make up the general part. Extra instructions are given directly before the relevant operations.

- This operating manual contains the most important information required to operate the ma-chi-ne safely.
- The safety information must be observed by all persons who are working at the machine.

2.2 Symbol and notice explanation

In the operating manual the following terms and signs are used for hazards:

⚠ DANGER!

This symbol means imminent danger.

Failure to comply with these instructions may lead to severe or fatal in-- jury.

⚠ WARNING!

This symbol means possible danger.

Failure to comply with these instructions may lead to severe or fatal in-- jury.

⚠ CAUTION!

This symbol means imminent danger.

Failure to comply with these instructions may lead to personal injury or material damage.

NOTE!

This symbol means possible danger.

Failure to comply with these instructions may lead to personal injury or material damage.

IMPORTANT!

Under this symbol suggestions and tips for use can be found and other particularly useful information is provided.

These symbols and notices help you to optimally use all functions on the machine and make your work easier.

2.3 Responsibility of the operator

- The operator is obligated to only let persons work at the machine who

  - are aware of the essential regulations with regard to workplace safety and accident prevention and are familiar with the use of the machine.

  - have read and understood the safety section and the warning notices in this operating manual and have confirmed so with their signature.
- The work is checked at regular intervals to ensure that safety procedures are followed.

2.4 Responsibilities of the personnel

All persons who are commissioned to work at the machine are obligated before beginning work

- to adhere to the essential regulations with regard to work safety and accident prevention,
- to read the safety section and the warning notices in the operating manual and confirm their understanding of these with their signature,
- to obtain information about the operation before using the machine.

2.5 Organisational measures

- The necessary personal protective equipment must be provided by the operator.
- All existing safety devices must be checked regularly.

2.6 Informal safety measures

- The operating manual must be **permanently retained at the site** of the machine. It must be easily accessible to the operators at all times.
- Supplementary to the operating manual, the general and local regulations on accident prevention and environmental protection must be provided and adhered to.

- All safety instructions and hazard warnings must be retained at the machine and must be le-g-ible.
- With every change of owner or when the machine is on loan to other persons, the operating manual must be handed over and its importance pointed out.

2.7 Training of personnel

- Only qualified and trained personnel are allowed to work at the machine.
- The responsibilities of the personnel must be clearly specified with regard to transport, instal--lation and removal, start-up, positioning and rigging, operation, maintenance and inspection, and repairs.
- Trainees are only allowed work at the machine under the supervision of an experienced per--son.

2.8 Risks and dangers when using the machine

The machine is built using the best available technology and in accordance with the recognised safe--ty regulations. However, through its use danger to the life and well-being of the operator or third party may arise, as well as material damage.

- The machine is only to be used
  - for its intended purpose
  - and when it is in perfect condition with regard to safety.
- Faults which may impact safety must be eliminated immediately.

2.9 Maintenance and inspection, repairs

- All maintenance and repair work must be carried out when the **machine is disconnected from the power supply**.
  At the same time, the machine must be safeguarded against its unintentional restart.
  - Lock switch cabinet
  - Switch off main switch
  - Remove ignition key from machine
  - Attach warning sign against restart.
- Compulsory maintenance and inspection work must be carried out in accordance with sche-d-ule.
- Operators must be informed before beginning maintenance and repair work.
- Disconnect all machines, upstream and downstream plant components and service mediums such as hydraulic oil and safeguard against unintentional startup.
- When replacing large components, carefully attach and secure them to hoisting devices.
- Check security of all screw connections.
- Doors and covers of the machine must only be opened after moving parts are stationary.
- Once maintenance work is finished check operation of safety devices.

2.10 Protective devices

- The use of protective devices must not be bypassed or avoided.
- Before the machine is switched on all protective devices must be properly attached and func--tional.
- Protective devices must only be removed

  - after the machine has been inoperative and

  - safeguarded against its unintentional restart.
- In the case of delivery of part components the protective devices must be fitted by the operator in accordance with regulations.

2.11 Safety measures in normal operation

- Only operate the machine when all protective devices are fully functional.
- Before switching on the machine ensure that nobody can be put at risk from starting up the machine.
- Inspect the machine at least once a day for noticeable external damage and check the opera--tion of safety devices.

2.12 Danger due to electrical power

- Work on electrical systems must only be carried out by qualified electricians.
- Electrical fittings of the machine must be checked regularly. Loose connections and damaged cables must be replaced immediately.
- The switch cabinet must be constantly kept locked. Access only by authorised personnel with key or appropriate tool.
- If work on live parts is necessary, then a second person must be present who can switch off the main switch in case of emergency.

2.13 Hazards resulting from hydraulic energy

- Only trained experts with special knowledge and experience in hydraulics may work on hydrau--lic devices.
- System sections and pressure lines that need to be opened must be depressurised before commencing repair work.
- Replace hydraulic-hose lines at appropriate intervals, even if no safety-relevant defects are de--tectable.

2.14 Particular dangers

Risk of tipping due to subsidence or exceeding of the permissible drive inclination.

Machine can crush persons located beneath it.

- ⇒ Only erect and move the machine on safe, solid ground.
- ⇒ Do not exceed permissible drive inclinations

Risk of injury due to falling material.

People can be killed or buried.

- ⇒ Do not stand within the discharge area of running belts.
- ⇒ Feed hopper area forbidden during loading.
- ⇒ Wear a safety helmet.

Injuries due to reaching into the unbalance of the screening machine or into the conveyor belts.

Limbs can be torn out.

- ⇒ Only execute maintenance work when the machine is stationary.
- ⇒ Never bypass safety devices.

Injuries due to slipping on the polluted machine.

Very serious fractures can result.

- ⇒ Keep machine and platforms clean.
- ⇒ Use stable ladders and the operator platform.

Injuries due to reaching into or falling into the crusher.

Risk of fatal injury!

- ⇒ Never eliminate blockages when the crusher is running.
- ⇒ Never climb on the vibrating conveyor chute during operation.
- ⇒ Never reach into the running crusher with bars.

Eye injuries due to stone chips, dust, reinforcing steel.

Permanent eye damage can result.

⇒ Wear safety goggles.

Eye injuries and scalds due to squirting hydraulic oil.

Can result in burns and blindness.

- ⇒ Always switch off and depressurise the hydraulics before performing maintenance and repair work
- ⇒ Replace defective hydraulic hoses immediately.

Danger from touching electric lines.

Can result in lethal electric shock.

- ⇒ Repairs to the electrical system must be performed by a skilled electrician.
- ⇒ Replace damaged cables immediately.
- ⇒ Keep switch cabinets closed.

Injuries due to trapping between the machine and a shovel loader or excavator.

Fatal crushing injuries can result.

- ⇒ Do not stand between the machine and the loading device.

2.15 Structural modifications to the machine

- No modifications, additions or conversions may be made to the machine without the manufacturer's permission. This also applies for welding work to structural components.
- All conversion measures require written confirmation from the manufacturer.
- Machine components that are not in perfect condition must be replaced immediately.
- Only use genuine Kleemann spare and wearing parts.

2.16 Cleaning the machine and disposal

- The materials and substances must be handled and disposed of appropriately, particularly when
  - Working on lubricating systems and lubricating devices and
  - Cleaning with solvents.

2.17 Vibrations

During its operation, the machine is subject to stress from vibrations. On the maintenance platforms, which can only be used for maintenance purposes, vibration acceleration occurs.

2.18 Noise

A considerable continuous sound pressure level is generated by the machine.

Hearing protection is therefore necessary in the area of the machine in order to avoid damage to hea-ring.

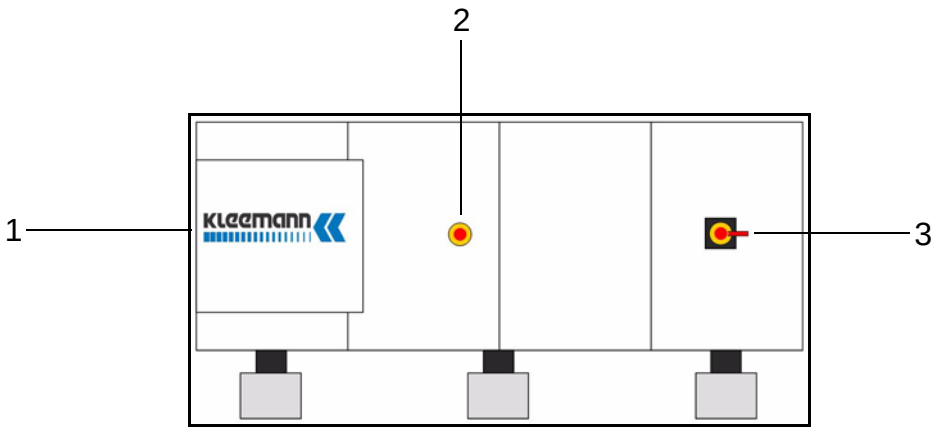
2.19 Warranty and liability

As a basic principle our "General Terms and Conditions of Sale and Delivery" apply. These are avai-l-able to the operator no later than at conclusion of contract. Warranty and liability claims in the case of personal and material damage are ruled out if they are caused by one or more of the following:

- use of machine other than its intended purpose
- improper installation, startup, operation and maintenance of machine
- use of machine with defective safety devices or safety devices not fitted according to the rules or non-functional safety and protective devices
- non-use of original Kleemann replacement and wearing parts
- non-compliance with information in the operating manual with regard to transport, installation and removal, start-up, positioning and rigging, operation, maintenance and inspection, and re--pairs.
- structural changes made to machine without manufacturer's authorisation
- inadequate inspection of machine parts that are subject to wear and tear
- repairs carried out improperly
- catastrophes caused by impact of foreign material and Acts of God.

3 Operating and display elements

3.1 Switch cabinet



0000163

No.	Designation	Function
1	Control panel	Control and monitoring of the complete system (see “Control panel”)
2	Emergency-stop	General emergency stop (see “Emergency-stop”)
3	Main switch	Disconnects all loads from the generator. Exception: Exempt circuits (see “Exempt circuits”). Main switch can be locked with a padlock

⚠ CAUTION!

Damage to property!

Electronics within the switch cabinet will be damaged by dirt.

Keep switch cabinet closed during operation.

3.2 Socket outlets on the switch cabinet

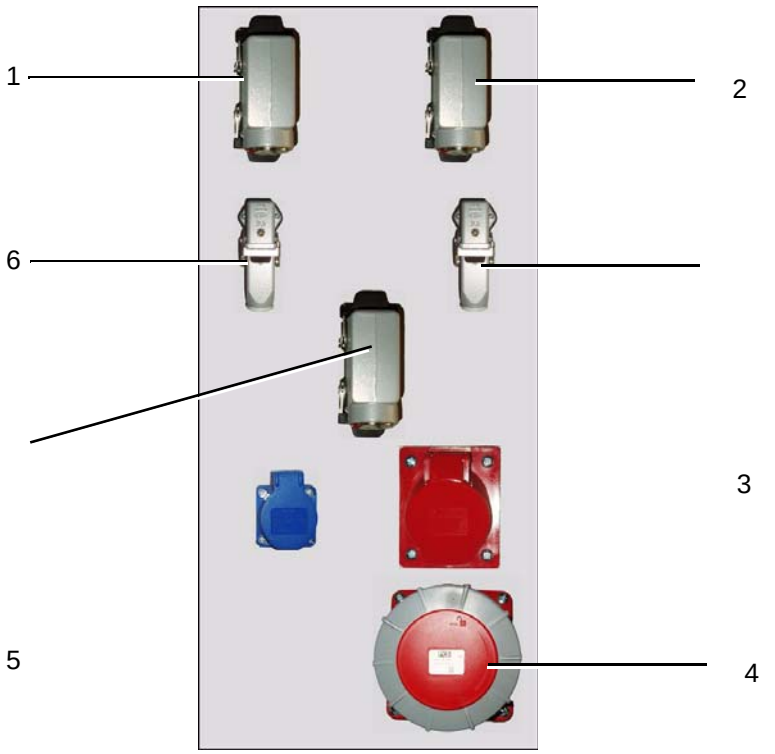
⚠ CAUTION!

Material damage!

Contacts in danger of being destroyed.

Only insert connectors in socket outlets when de-energised.

Contacts must be clean.



0000874

No.	Description	Function
1	Locking device	Connection for electrical locking device of a connected follow-up machine (e.g. Mobiscreen)
2	Socket outlet for belt 2	Socket outlet for additional conveyor belt 2
3	Socket outlet	Connection for discharge conveyor of plant
4	Socket outlet 0x1 follow-up machine	Socket outlet connection for power supply to follow-up machine (e.g. Mobiscreen)
5	Socket outlet	Socket outlet connection for discharge conveyor of plant
6	Socket outlet	Connection for emergency stop of additional conveyor belt

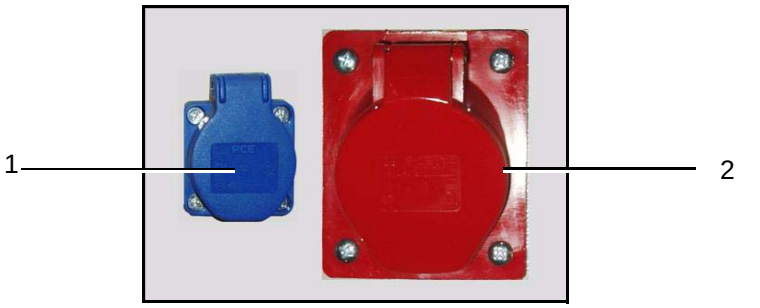
3.3 External circuits

⚠ WARNING!

Electrical voltage!

Socket-outlets of external circuits are live even when the main switch is switched off!

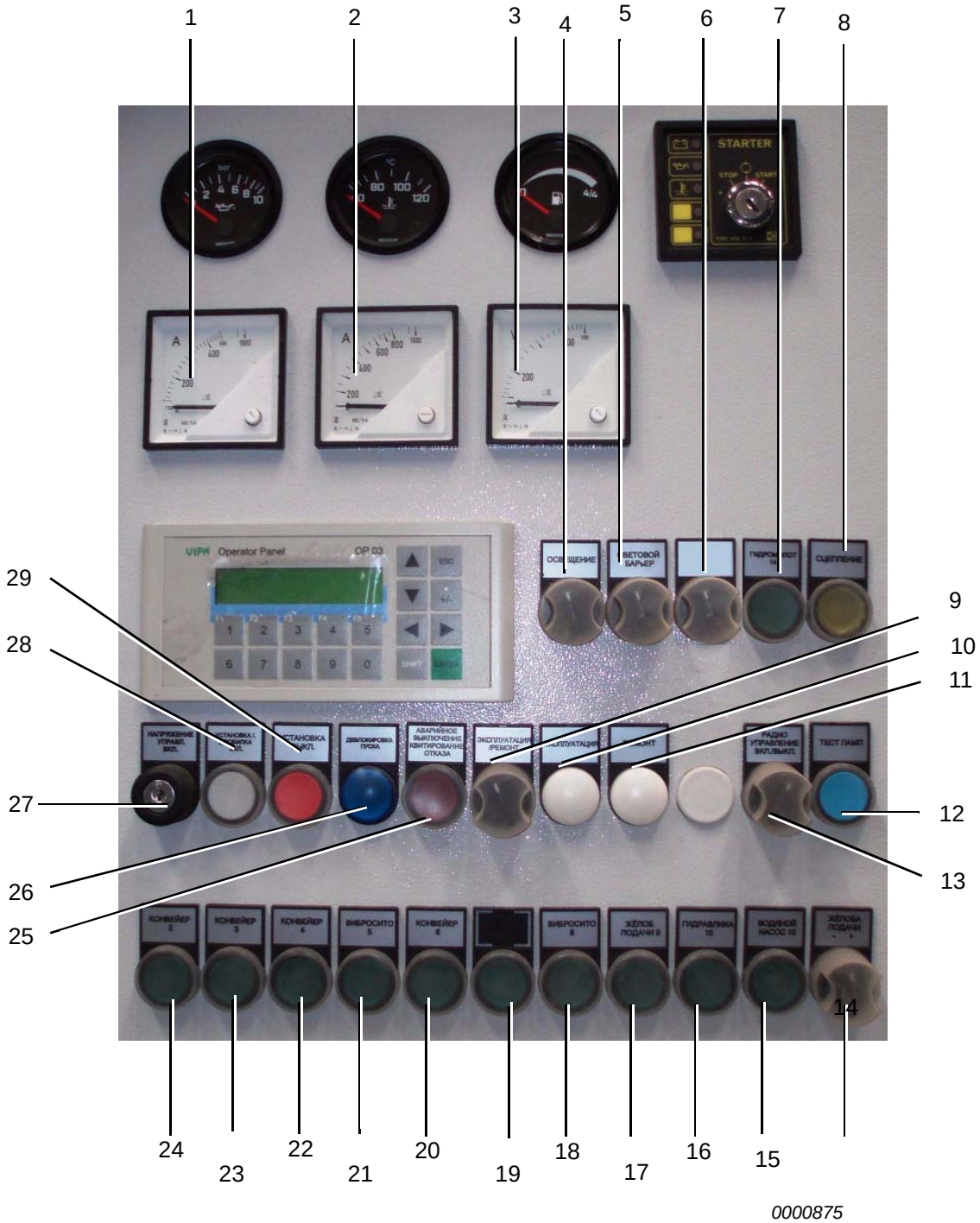
To switch off the complete unit, press emergency-stop on switch cabinet.



0000435

No.	Designation	Function
1	Socket-outlet	Service socket-outlet (230V / 16A)
2	Socket-outlet	Service socket-outlet (400V / 32A)

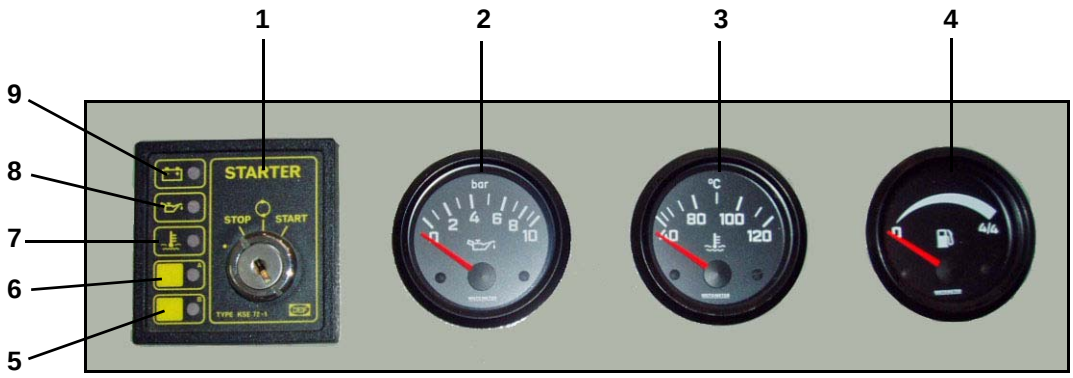
3.4 Operator panel



No.	Designation	Function
1	Current meter	Displays current consumption of crusher motor
2	Current meter	Displays current consumption of entire plant
3	Voltage meter	Displays voltage
4	Lighting	Monitoring switch for turning on the lighting
5	Light barrier ON / OFF	Switch for turning the light barrier on and off
6	Supports up / down	
7	Rock chisel	ON / OFF push button for rock chisel
8	Coupling	Push button for engaging and releasing the coupling
9	Operation / Repair	Monitoring switch for changing Operation / Repair operating modes. When in "Repair" mode, the sequential locking device of the machines is switched off.
10	Operation	Displays "Operation" mode
11	Repair	Displays "Repair" mode
12	Lamp test	Checks control lamps
13	Radio ON / OFF	ON/OFF switch for radio remote control
14	Feeder trough + / -	Switch to increase / reduce speed of the feeder trough
15	Water pump	Switch for turning the water pump on and off
16	Hydraulics	ON / OFF push button for the hydraulic power pack
17	Feeder trough 9	ON / OFF push button for feeder trough
18	Screen 8	ON / OFF push button for vibrating screen plant
19	Conveyor belt 7	ON / OFF push button for conveyor belt
20	Conveyor belt 6	ON / OFF push button for conveyor belt
21	Screen 5	ON / OFF push button for vibrating screen (classifying screen)
22	Conveyor belt 4	ON / OFF push button for conveyor belt
23	Conveyor belt 3	ON / OFF push button for conveyor belt
24	Conveyor belt 3	ON / OFF push button for conveyor belt
25	Malfunction reset / emergency stop	Push button for malfunction reset / emergency stop
26	Start release	Lights up as soon as the plant is ready to start
27	Control voltage	Key switch for turning the control voltage on and off
28	Plant ON	Push button for switching on the plant
29	Plant OFF	Push button for switching off the plant

3.4.1 Motor monitoring unit

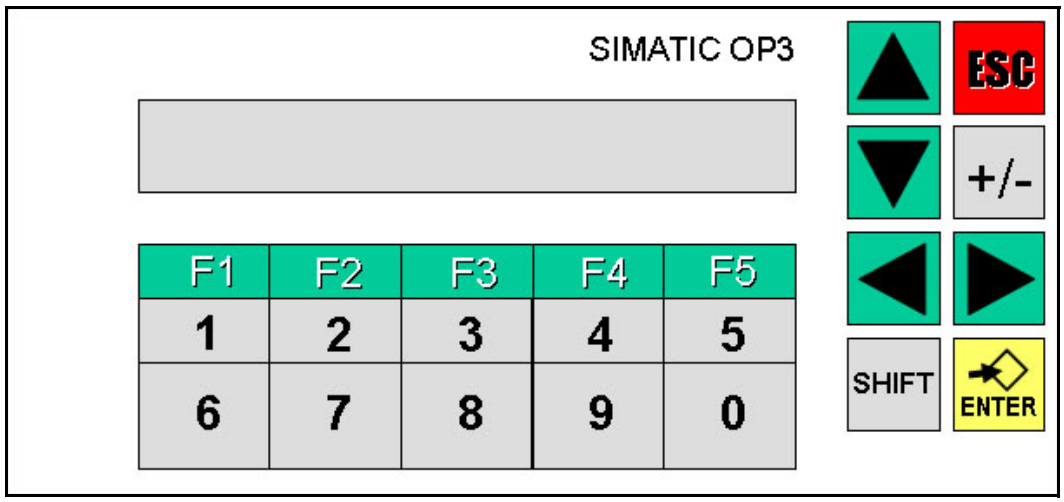
The motor monitoring unit is an individual control panel, which is integrated into the control panel of the switch cabinet.



No.	Designation	Function
1	Key-operated switch	Diesel generator start and stop
2	Oil pressure indicator	Displays the oil pressure
3	Coolant temperature indicator	Displays the coolant temperature
4	Fuel gauge indicator	Displays the level of fuel in the tank
5	Indicator light B	Indicates a dirty air filter =>Motor switches off automatically
6	Indicator light A	Indicates shortage of cooling water =>Motor switches off automatically
7	Overtemperature indicator light	Indicates that the coolant temperature is too high =>Motor switches off automatically
8	Oil pressure indicator light	Indicates a drop of the lubricating oil pressure below the permissible value. =>Motor switches off automatically
9	Ignition indicator light	Illuminates when the ignition is switched on

3.4.2 Control panel OP3

3.4.2.1 Layout



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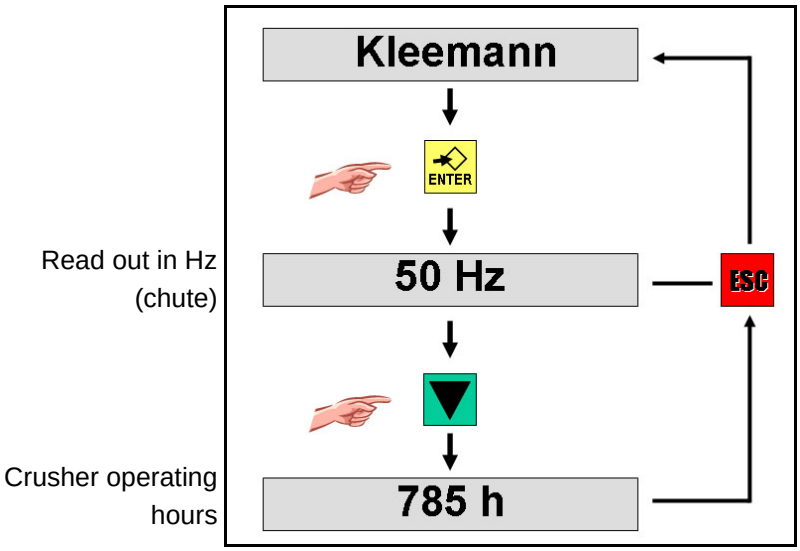
3.4.2.2 Operating hours display



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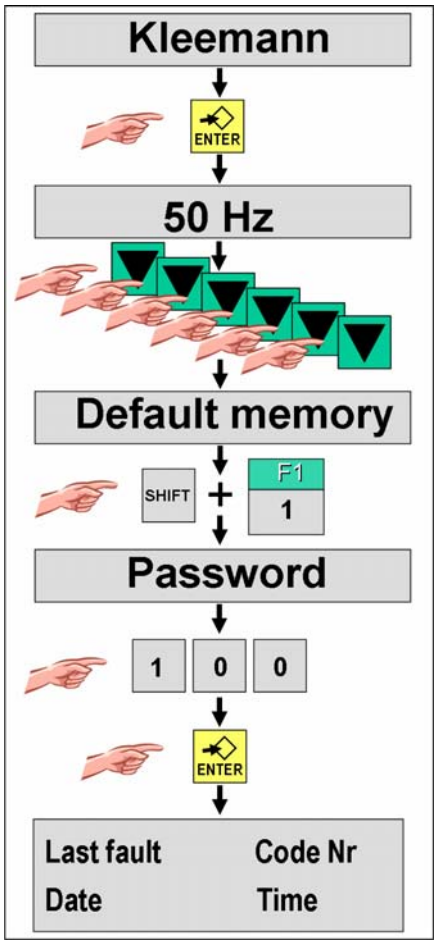
3.4.2.3 Fault memory



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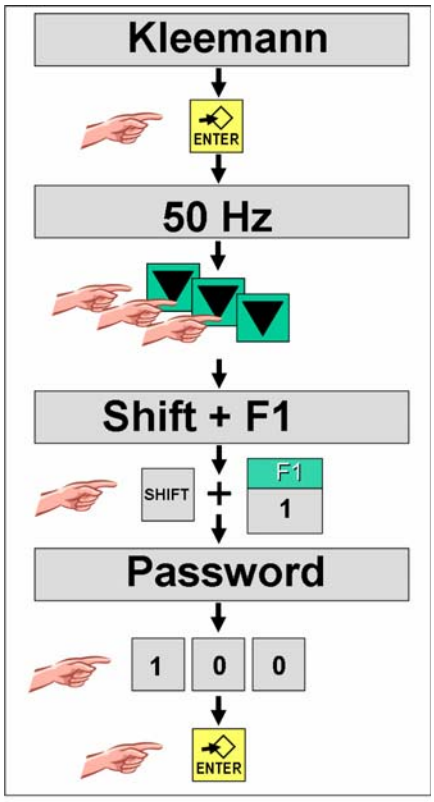
3.4.2.4 Adjusting and checking parameters



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3.5 Frequency converter

0000205

⚠ DANGER!

Risk of injury and death due to electric shock!
Stored energy is still present after switching off.
Injuries can result due to electric shock at 400V.
=>Wait for discharge time!
=>Maintenance and adjustments must be carried out by skilled electricians!

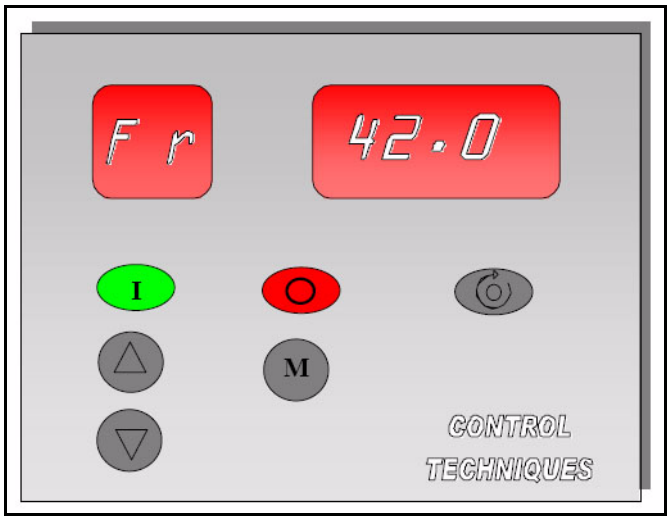
⚠ CAUTION!

Damage to property!

Incorrect charging or incorrect starting of the feed chute will result in the chute constantly switching on and off. This maloperation can cause da-mage to the frequency converter and / or the vibration motors.

Adjust the feed chute and material quantity with the frequency converter so that the automatic shut-down device only actuates in extreme cases (maximum 10 times per hour acceptable).

Commander SE frequency converter



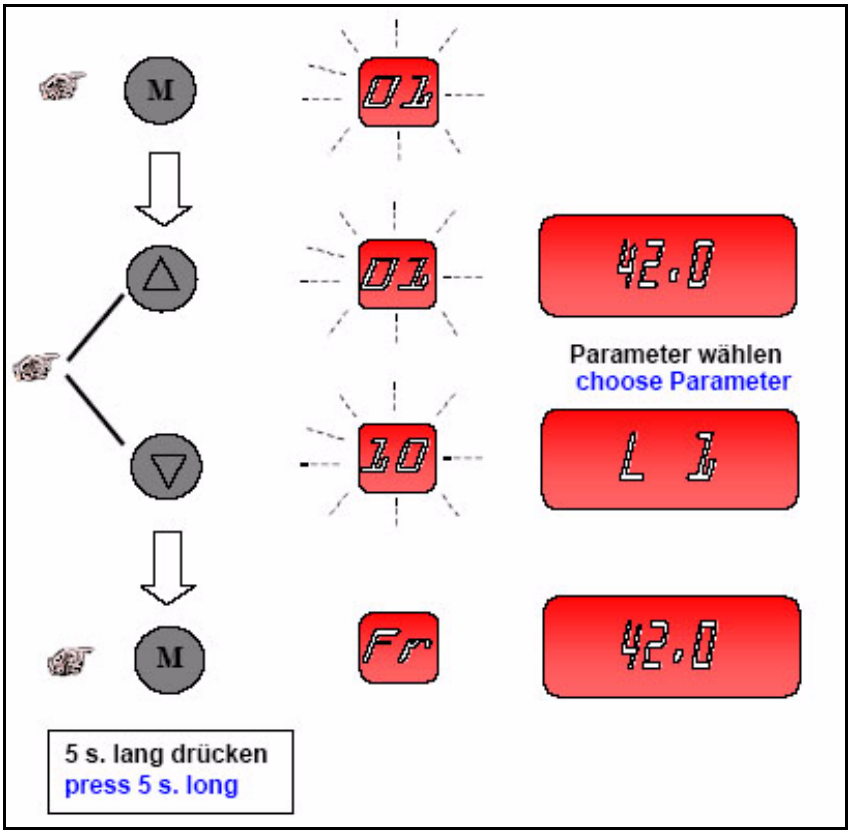
0000003

Factory settings

Parameter	Description	Unit	Input
01	Min. Frequency	Hz	42
02	Max. frequency	Hz	55
03	Acceleration ramp	Hz/s	5.0
04	Braking ramp	Hz/s	35.0
05	Set value[1]		A1.A2 / A2Pr
06	Motor rated current [2]	A	
07	Motor rated speed	Rpm	0
08	Motor rated voltage	V	400
09	Motor power factor	Cos phi	0.85
10	Parameter access level		L1

1.Control of the frequency converter
Potentiometer = A1.A2
+/- button = Pr
2.Dependent on motor rated current

Check parameter



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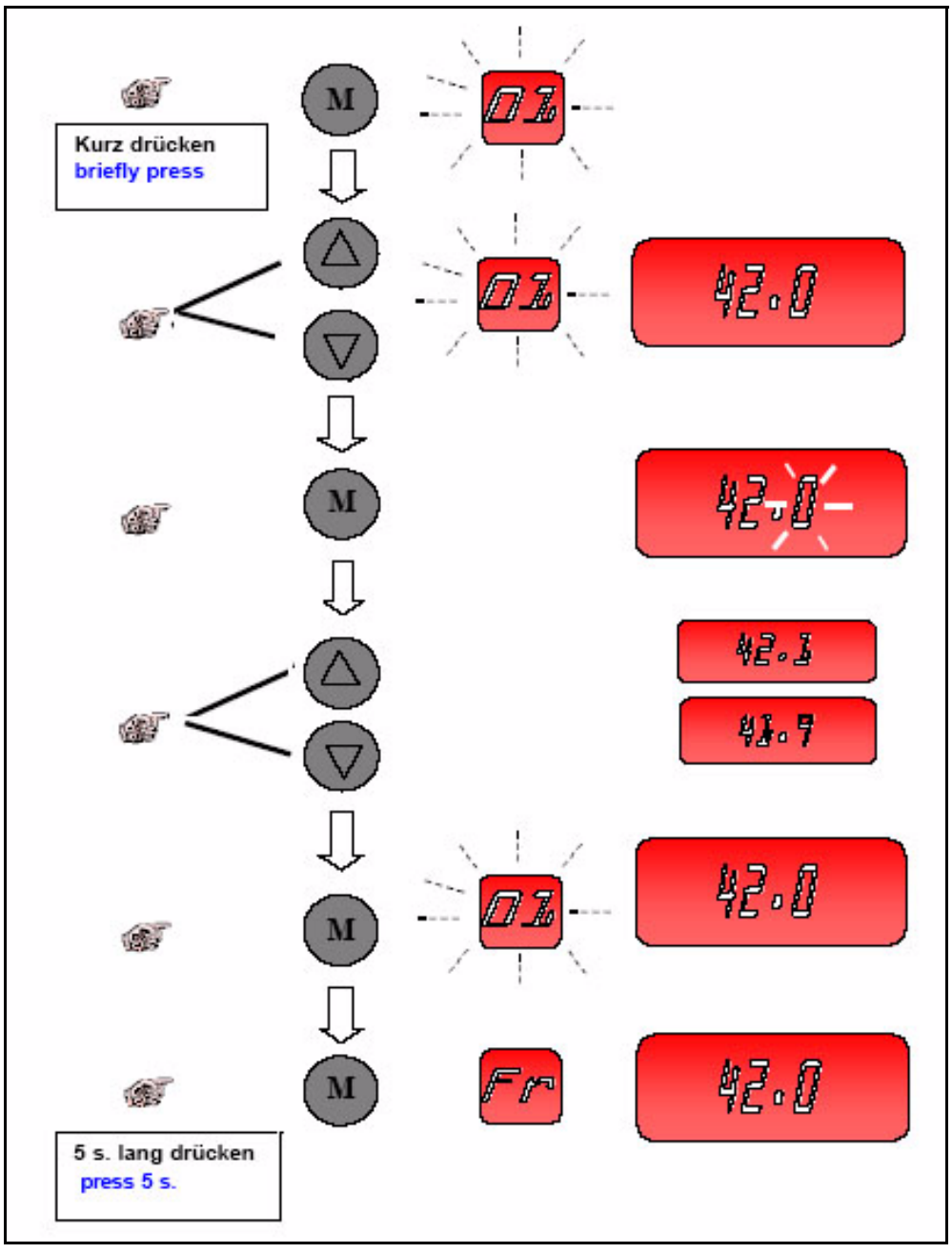
Set parameter



0000006

Display character

Left display	Mode status
rd	Converter released, awaiting START
ih	Converter blocked
tr	Error status
dC	DC braking active

Left display	Speed indications
Fr	Selection: Actual value as frequency in [HZ]
SP	Selection: Actual value motor speed in [rpm]
Cd	Selection: Actual value unit user-defined

Left display	Load indications
Ld	Active in-phase current in % of active motor rated current
A	Device output phase current in [A]

Error messages

Error cause	Right display
Undervoltage intermediate circuit	UU
Overvoltage intermediate circuit	OU
Overcurrent in converter output	OI.AC
Overcurrent in braking resistor	OI.br
Error in external interference chain	Et
Overspeed threshold	O.SP
Self-adjustment error	tunE
Braking resistor overloaded	It.br
Motor overload (Ixt)	It. AC
Overtemperature	Oht1
Heat sink overtemperature (triggered by thermistor)	Oht2
Motor overtemperature (triggered by PTC thermistor)	th
Overloading of +24 V or a digital output	O.Ld1
Current loop loss terminal 5 (4-20 mA, 20-4 mA)	cL
Serial communication interrupted	SCL
EEPROM error	EEF
Phase loss of mains voltage (only with 3-phase devices)	PH[1]
Error during measurement of stator resistance	rS
User-defined error with xx as error cause	trxx
Field bus interruption during operation	F.bus
Error in Quickey memory (SE55)	C.Err
Quickey (SE55) without data	C.dat
Quickey (SE55) write error	C.Acc
Quickey (SE55) device type deviation	C.rgt
Overloading of supply for serial interface	O.Ld2
Overloading of current loop input	O.cL
Error internal converter self-test	HF

1.3-phase

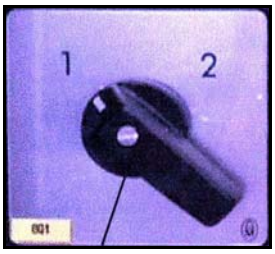
Frequency converter changeover switch

⚠ CAUTION!

Caution - damage to property!

Risk of damage to the electronics!

Only switch the frequency converter from frequency to mains operation in de-energised state.



0000004

Position 1: Frequency converter off

Position 2: Frequency converter on

3.6 Radio control (option)

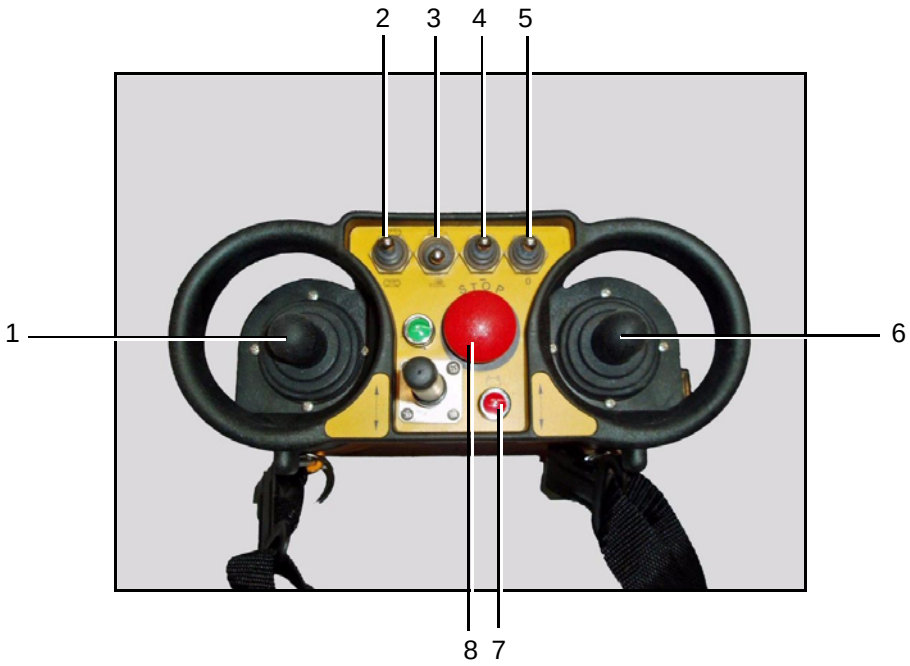
⚠ WARNING!

Obscured system!

Because of the obscured system, persons in the traversing range can be fatally injured.

=>Always move the system with the help of a reliable marshaller

=>Constant eye contact with the marshaller



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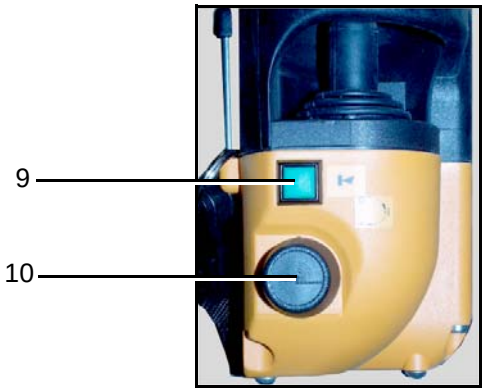


0000166

No.	Designation
1	Control for left track forward - back
2	no function
3	Control for chain slow / fast
4	Control for frequency of feed chute slow / fast
5	Control for feed on / off
6	Control for right track forward - back
7	Battery warning lamp
8	Emergency-stop
9	Acknowledge Emergency Stop
10	Switch on remote control

The system can be remotely controlled up to a distance of approx. 30 m (100 ft) with the radio remote control. The “Radio” selector switch on the switch cabinet must be at the appropriate setting for operation of the radio remote control. The system must be switched on manually at the switch cabinet even if using radio control.

Activate radio control

- Switch on radio control using the side control knob (10)
- Release the emergency stop (8)
- Acknowledge Emergency Stop (9)

NOTE!

If operating the system with the radio remote control, the radio should generally be activated before switching the system on.

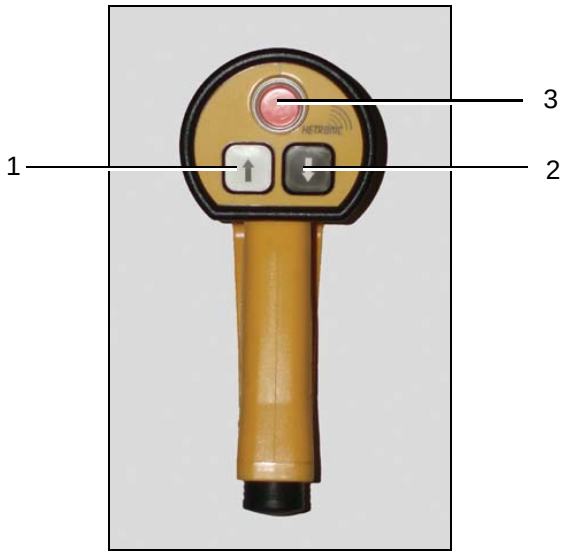
⚠ CAUTION!

Caution - damage to property!

Risk of damage to the receiver electronics!

When carrying out welding work on the system, remove the control cable from the receiver.

3.7 Radio control (option)



000009

No.	Designation	Function
1	Screen on	• First switches on the vibration screen • Feed chute switches on with a 5 sec. delay
2	Screen off	Switch off feed chute and vibration screen
3	System off	Corresponds to a System Off of the system. • All machines are switched off. • The crusher is switched off with a delay.

The system can be remotely controlled up to a distance of approx. 30 m (100 ft) with the radio remote control. The “Radio” selector switch on the switch cabinet must be at the appropriate setting for op-e-ration of the radio remote control. The system must be switched on manually at the switch cabinet even if using radio control. No additional activation of the radio control is required.

NOTE!

If operating the system with the radio remote control, the radio should generally be activated before switching the system on.

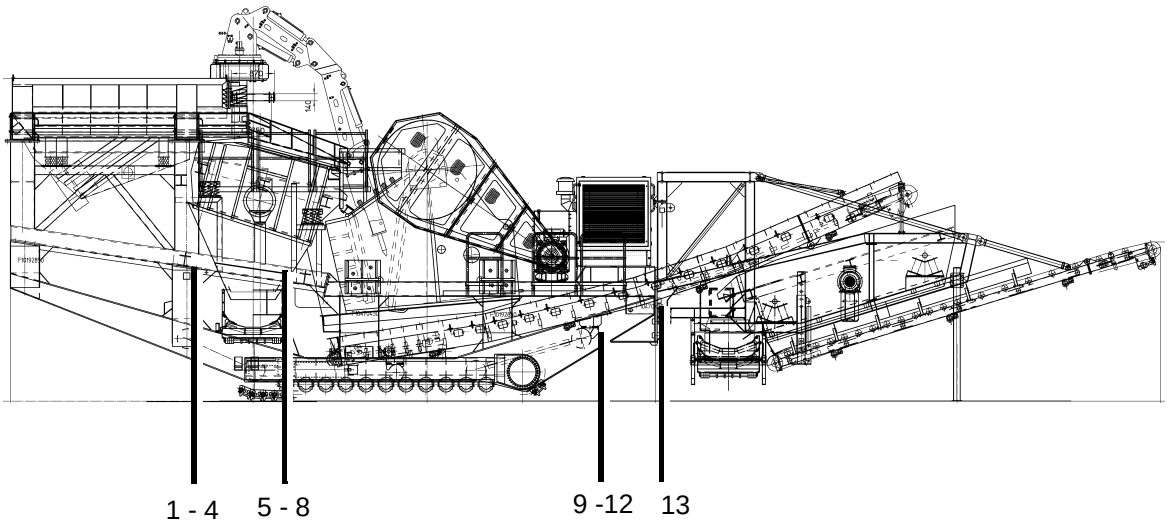
⚠ CAUTION!

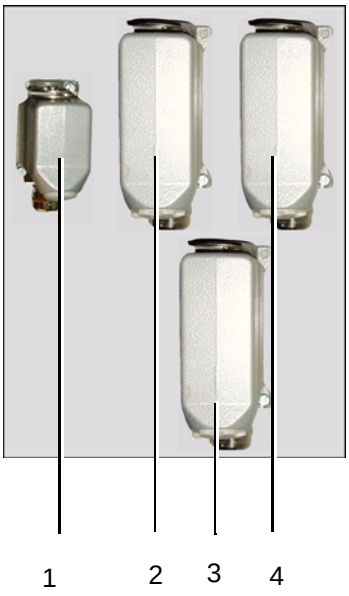
Caution - damage to property!

Risk of damage to the receiver electronics!

When carrying out welding work on the system, remove the control cable from the receiver.

3.8 Socket outlets on the chassis





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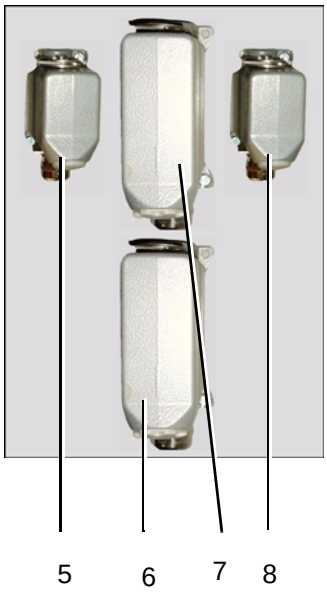

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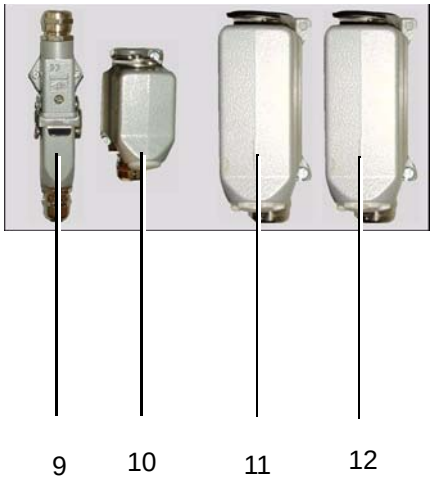

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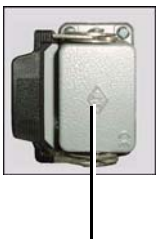


0000881

No.	Description	Function
1	Socket outlet	Light barrier
2	Socket outlet	Feeder trough drive (left)
3	Socket outlet	Reserve belt drive
4	Socket outlet	Feeder trough drive (right)
5	Socket outlet	Emergency stop for side discharge conveyor (both sides)
6	Socket outlet	Screen drive
7	Socket outlet	Emergency stop platform (both sides)
8	Socket outlet	Side discharge conveyor, drive (both sides)
9	Socket outlet	Supporting elements for sensor
10	Socket outlet	Emergency-stop for classifying screen
11	Socket outlet	Classifying screen, discharge conveyor drive
12	Socket outlet	Classifying screen drive
13	Socket outlet	Radio remote control for rock chisel

NOTE!

In order to operate or move the plant without a side discharge conveyor, a dummy plug must be inserted in the "Emergency-stop" socket outlet of the side discharge conveyor.

3.9 Emergency-stop

3.9.1 Emergency stop buttons

⚠ WARNING!

The functioning of the emergency stop buttons must be checked daily.

⚠ WARNING!

Loads that are connected to the socket-outlets of exempt circuits and to socket-outlet 0X1 for follow-up machines are not switched off by the emergency-stop.

Injuries due to connected machines.

=>Switch off the diesel generator in emergencies!

0000226

Press emergency-stop in case of danger!

All drives, except the crusher, are stopped immediately.

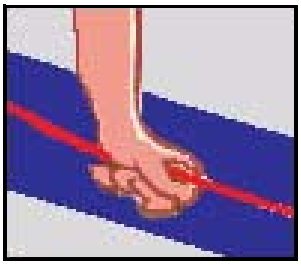
To stop the crusher immediately, press the **“Crusher” button** on the switch cabinet or the **emergency stop button on the switch cabinet.**

Pressing the emergency stop button on the switch cabinet stops the entire unit.

Releasing the emergency stop button

- turn clockwise
- and pull out

3.9.2 Emergency pull-wire



0000225

Pull the emergency pull-wire in case of danger!

All drives, except the crusher, are stopped immediately.

To stop the crusher immediately, press the **“Crusher” button** on the switch cabinet or the **emergency stop button on the switch cabinet.**

Pressing the emergency stop button on the switch cabinet stops the entire unit.

Releasing the pull-wire switch

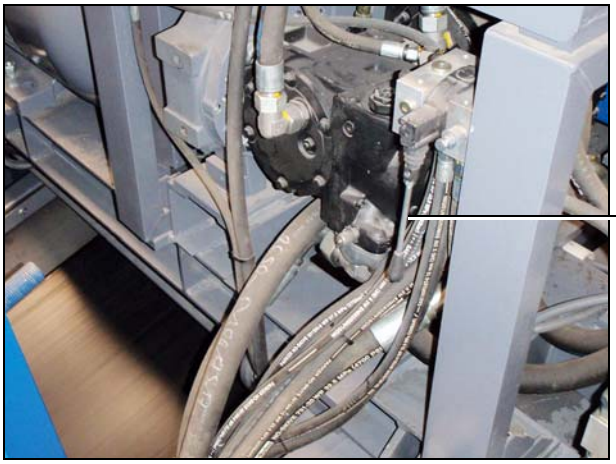
- Return pull-wire switch lever to central position

or

- pull the button out

3.10 Hydraulic functions of valve block

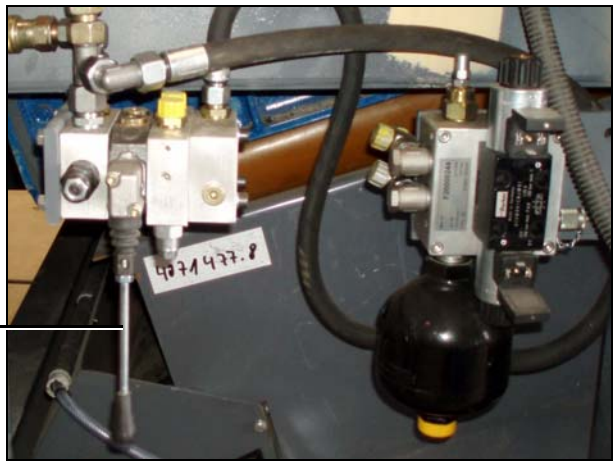
3.10.1 Auxiliary function of valve block



0000921

No.	Description	Function
1	Gap setting for jaw crusher	Shifts the rocker hydraulically

3.10.2 Supporting elements for valve block (optional)



0000882

No.	Description	Function
1	Supporting elements	Extending and retracting the supporting elements

NOTE!

The supporting elements provide support for the classifying screen during operation of the plant. When the supporting elements are extended, the hydraulics control the pressure on the subsurface thus ensuring consistent support.

3.11 Operating modes

There are two operating modes:

- Operation
- Repair

The operating modes are changed using a key-operated switch in the switch cabinet.

Operation:
Normal operating mode

All machines are electrically interlocked and can only be switched on inversely to the flow direction. This prevents material jams.

Repair:
Special operating mode for repairs and for moving the system.

The electrical interlock has been cancelled. The individual machines can be switched on and off as desired.

⚠ CAUTION!

Inadvertent start-up of a machine in repair mode can result in injuries and/or material jams.

Therefore only use the “Repair” operating mode in exceptional cases and with appropriate care.

4 Starting up

4.1 Safety information

⚠ WARNING!

Incorrect installation may lead to personal injury or damage to machine when starting up.

- **Before switching on machine, ensure that**
  - **nobody is in hazard area,**
  - **the immediate shutdown of machine is guaranteed (emergency stop function).**
- **The machine may only be set up by persons with a sound knowledge of the machine.**
- **The operator (machinist) accepts full responsibility for the safety of persons who are in the hazard area of the machine.**

4.2 Installation

Before the system can be operated, it must be moved from the transport position to the work position. The activities described below must be performed for this purpose.

⚠ WARNING!

Risk of injury and damage to property through incorrect use of hoisting machinery and lifting tackle.

If transporting by crane, always use suitable cargo gear. Check proper condition of chains, ropes etc. beforehand.

Standing under suspended loads is forbidden.

Personal protective gear, e.g. helmet, safety shoes, gloves etc. must be worn during system installation.

During installation and dismantling, chains or ropes must be attached to fixed components with slip-resistant fastenings. The mounting must be located in the centre of gravity.

Installation and dismantling must be carried out by skilled personnel.

4.2.1 Erecting the machine

⚠ CAUTION!

Damage to property!

Risk of the machine tipping due to sinking on soft surface or unsuitable erection.

- **Always erect the machine on a stable and solid surface**
- **Position the machine horizontally**
- **Machine must not rock**
- **The crusher must not rock on the chassis during operation**
- **The surface must be level (spread fine material over the ground and then level)**

If the machine or crusher rocks, reposition the machine and / or re-level the surface.

4.2.2 Extend the flashing beacon

0000237

- Raise the holding tube
  Flashing beacon is extended
- Secure position with spring pin

4.2.3 Earth the machine

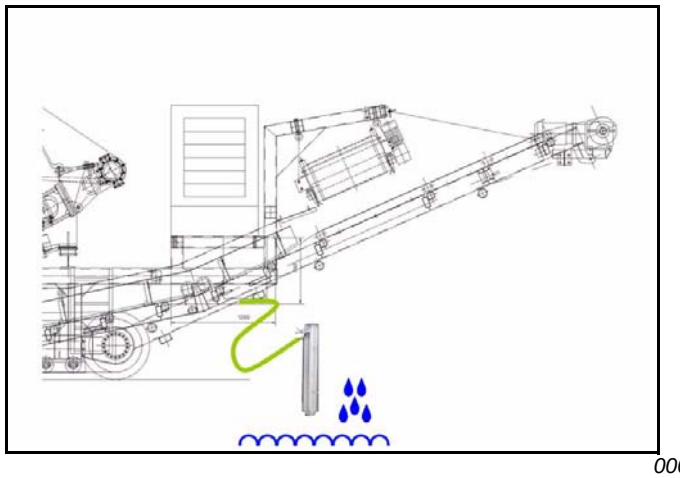
The machine must be earthed to ensure optimal connection of the protective earth conductor with the ground. This also prevents static charges due to the belts.

⚠ WARNING!

There is a risk of electric shock from unearthed or incorrectly earthed systems!

After each new erection, the system must be professionally earthed and levelled in accordance with the applicable guidelines.

If the ground is dry, the soil around the earthing rod must be watered.



0000229

Please note:

- Earth stake must be firmly positioned and must not wobble.
- Remove the earth connection before moving the machine.
- Defective earth connections must be replaced immediately.

4.2.4 Folding out main discharge conveyor

- Remove transport securing devices (1)

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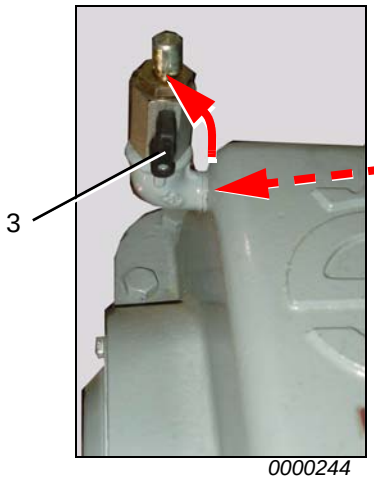
- Attach belt to hoisting gear
- Fold out the belt carefully

0000884

- Fit screws to folding point (2)



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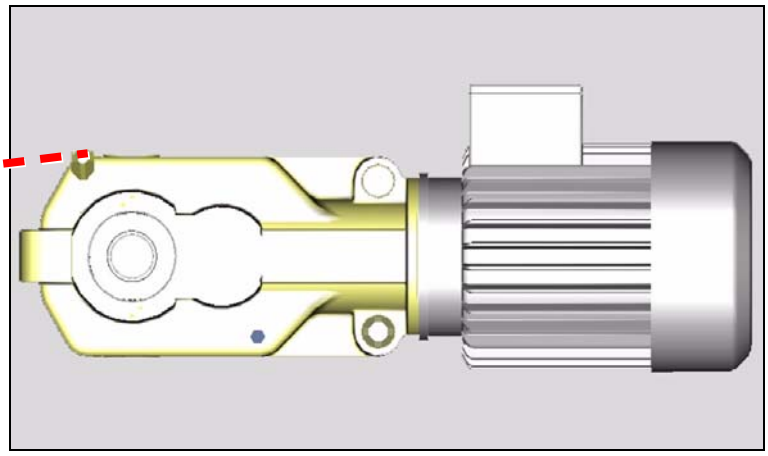
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- Open ventilation (3) of belt drive

4.2.5 Mount crushers

⚠ WARNING!

Risk of injury in the installation area!

Persons in the installation area can be injured by crushing.

- **Place the base unit on a firm, level foundation before installing the components.**
- **Do not stand in the danger area during installation.**

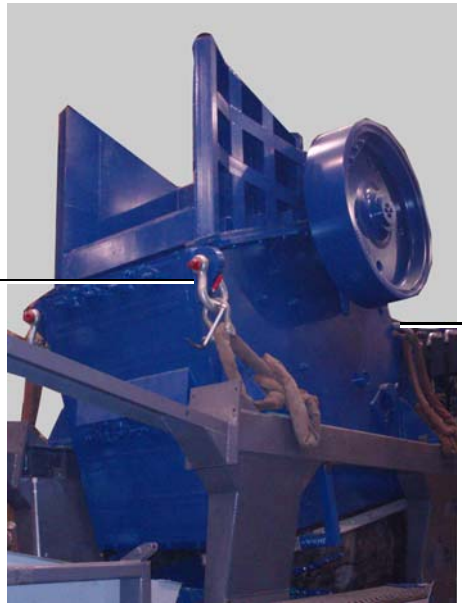
⚠ CAUTION!

Damage to property!

Note weight of the crushers!

Only use suitable hoisting gear.

- Suspend crushers from a suitable hoisting gear by the eyelets (1) provided



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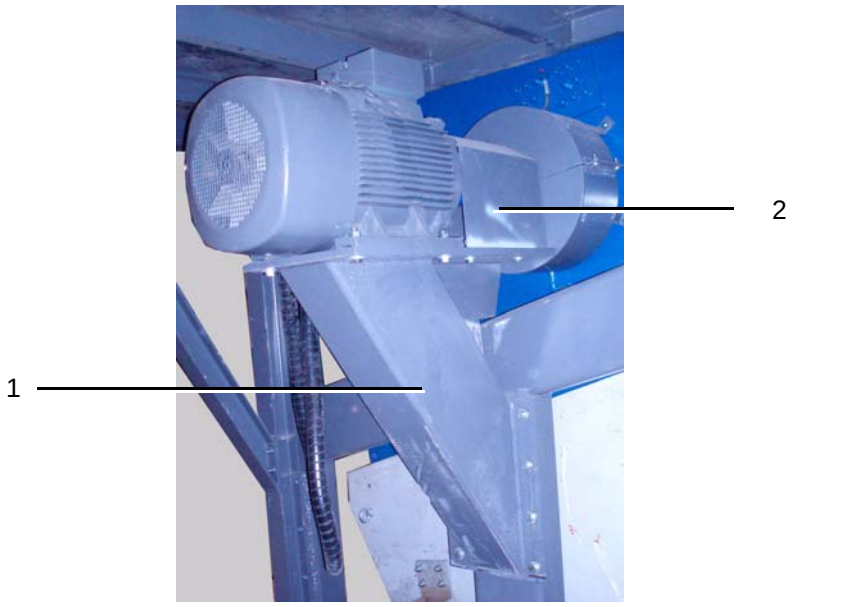
- Lift crushers carefully into the mounting points on the base unit
- Insert and tighten V-belts (see section Maintenance - Tightening V-belts)
- Fit belt guard
- Connect hydraulics

4.2.6 Installing the screen drive



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- Install the support (1) for the screen drive on the chassis
- Attach drive to suitable hoisting gear
- Run drive into the locators provided on the chassis

NOTE!

Observe markings on the cardan shaft.

- At the same time, insert cardan shaft into the counterpart
- Attach the screen drive to the console using screws
- Install cardan shaft protection (2)
- Plug the electrical connections and emergency stop into the appropriate sockets on the chas-- sis. Attach cardan shaft protection.

4.2.7 Mount feed unit

⚠ WARNING!

Risk of injury in the installation area of the feed unit!

Persons standing in the installation area are at risk of injury from trap--ping.

- **Before installing the feed unit, stand the base unit on level, stable ground.**
- **Do not stand in the danger zone when installing the feed unit.**

⚠ CAUTION!

Damage to property!

Note weight in the feed unit!

- **Only use suitable hoisting gear.**
- **Secure feed unit on several hoisting gears.**

NOTE!

The platform and screen motor can be mounted first.

0000692

- Clean contact surfaces.
- Suspend hopper extension from suitable hoisting gear at the eyelets provided (1)
- Lift hopper extension carefully onto the hopper
- Fasten and secure hopper extension to the hopper with bolts (2)
- Mount cross member (3) on the hopper extension

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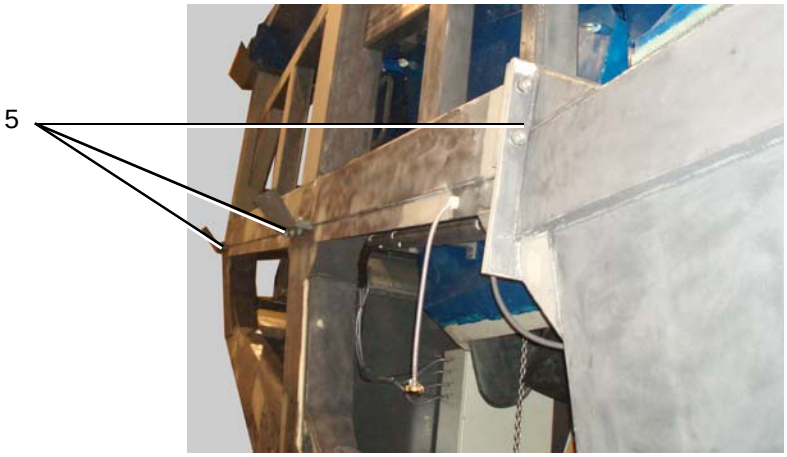
- Suspend feed unit from suitable hoisting gear at the eyelets (4) provided.
- Lift feed unit carefully into the mounting points on the base unit



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- Mount feed unit with screws on the base unit
- Pug in electrical connections to the screen and chute
- Remove transport locks from the screen and chute (6)

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4.2.8 Platform

⚠ WARNING!

Danger of falling!

Persons on the operating platform are in danger of falling when installing the railings.

Install the railings carefully.

Platforms are partly installed.

- Install missing platforms, superstructures and steps
- Install railing segments
- Install ladder protection
- Install ladders

4.2.9 Side discharge conveyor

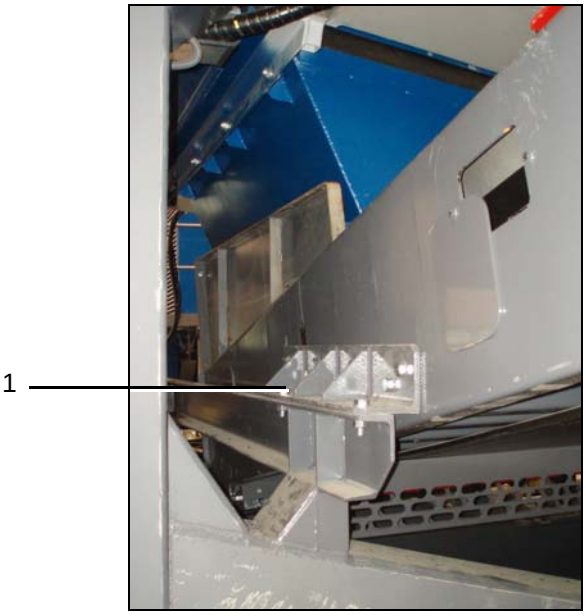
⚠ WARNING!

Risk of injury in area of installation!

Persons in the installation area of the belt conveyor may be at risk from crushing injuries.

- **Do not stand in the hazard area when the belt conveyor is being extended.**

- Connect the belt conveyor to the eyelets provided
- Lift the belt conveyor using suitable hoisting gear
- Fit and secure belt conveyor into the mounting points on the chassis frame (1)



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- Mount frame for suspension to plant (2)

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- Mount suspension between plant and belt conveyor (3)
- Mount feed hopper
- Insert the electrical connections and emergency-stop into the corresponding socket outlets on the chassis (see chapter "Socket outlets on the chassis")

4.2.10 Side discharge conveyor, classifying screen (optional)

⚠ WARNING!

Risk of injury in area of installation!

Persons in the conveyor belt installation area may be at risk from crushing injuries.

- **Do not stand in the hazard area when the belt conveyor is being extended.**

- Connect the conveyor belt to the eyelets provided
- Lift the belt conveyor using suitable hoisting gear

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- Fit and secure the belt conveyor into the mounting points on the chassis frame (1)
- Mount suspension between plant and belt conveyor (2)

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- Mount hydraulic cylinder (3)
- Mount feed hopper
- Insert the electrical and hydraulic connections and emergency-stop into the corresponding socket outlets on the chassis (see chapter "Socket outlets on the chassis")

4.2.11 Mounting of classifying screen (optional)

⚠ WARNING!

Risk of injury!

If the plant is being operated with a classifying screen, the return roller guard of the main discharge conveyor is removed. Thus there is an increased danger of being pulled in.Limbs may become trapped.

- **Keep an appropriate safety distance when carrying out visual inspections.**
- **Only perform adjustments when the conveyor belt is stopped.**

⚠ CAUTION!

Danger of material damage!

Classifying screen may tip over due to sagging of soft substructure.

- **Only position classifying screen on secure and steady substructure.**

- Secure and gently lift classifying screen using appropriate hoisting gear.

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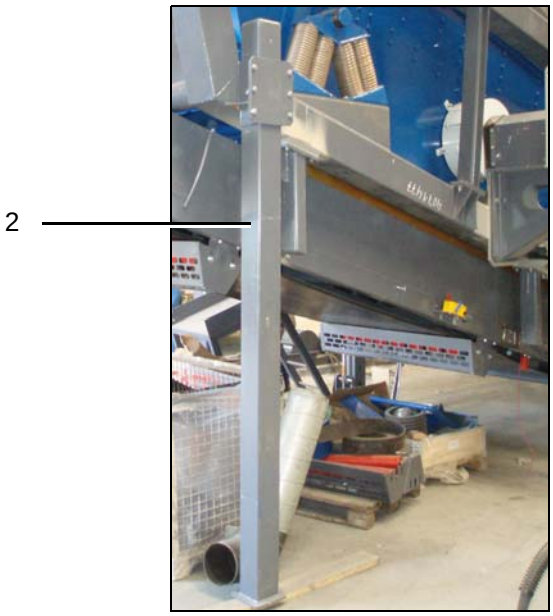
- Remove red transport supports (1) from the classifying screen.



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- Install grey auxiliary supports (2) of classifying screen.
- Tilt the classifying screen using the hoisting gear until the classifying screen is sitting on the auxiliary supports.

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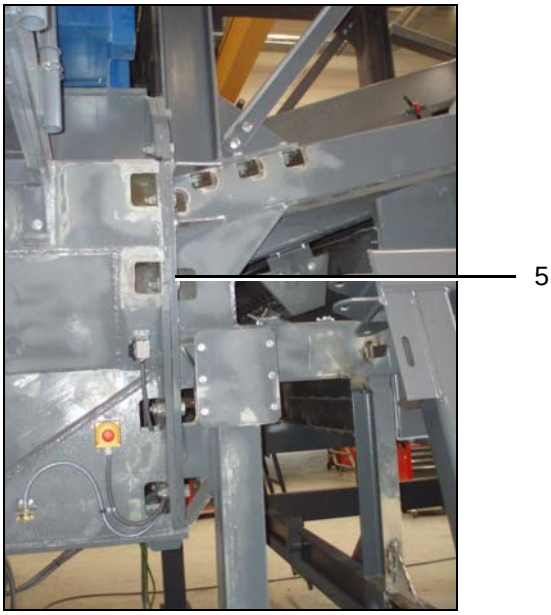
- Mount the frame (3) for the classifying screen suspensions
- Mount the suspensions (4) for the main discharge conveyor
- Position the plant for the classifying screen
- Carefully fit and secure the plant into the support points of the classifying screen



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- Screw the classifying screen to the plant (5)
- Fold out and mount the discharge conveyor of the classifying screen
- Mount the suspensions (6) for the classifying screen
- Carry out the electrical and hydraulic connections for the classifying screen

- Extend the hydraulic supporting elements
- Remove the grey auxiliary supports (2)

4.2.12 Extending the supports

- Remove transport securing device

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- Set selector switch (1) to "Supports down"
- Start machine
- Supports extend automatically

IMPORTANT!

Supports adjust automatically

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4.3 Inspection

The following inspections and checks must be carried out after every transport and installation of the machine.

⚠ CAUTION!

Danger due to foreign material in conveying devices!

Forgotten parts, e.g. tools or equipment, in conveyors may lead to disruptions and accidents.

=>After installation, check entire passage of material flow for foreign materials and remove them.
Main switch must be switched off during inspections.

4.3.1 Checks with the machine stationary

Oil levels:
Diesel motor:

- Before checking the oil level, the motor must be stationary for at least 5 minutes.
- For approved oil grade, please see operating instructions for the diesel generator.

Fuel level:

- The fuel gauge on the switch cabinet indicates the fuel level
- Top up the fuel if required (see “Operation” chapter)

Cooling water level:

⚠ WARNING!

Risk of scalding

Hot steam and water can escape when the cooling water tank is opened, causing scalds.

=>Open the cover of the expansion tank slowly, to allow the pressure to reduce.

⚠ WARNING!

Risk of poisoning

Anti-corrosion and antifreeze agents are toxic.

=>Do not ingest cooling water or bring it into contact with food.

For prescribed coolant please see diesel generator operating instructions.

Please note:

- Only use ready-mixed coolant that is nitrite-free and approved by the manufacturer.
- When topping up larger quantities of coolant, never pour cold coolant into a warm motor, as this can cause cracks in the motor.

V-belts:

- Check the V-belts for:
  - Cracks
  - Twisting
  - Tension

Spraying system level (option):

The level of the spraying system must be checked to prevent dry running of the pump.

- Check the suction hose to ensure that water is present up to the level of the pump.
- If the water level is lower:
  - Fill up the water tank
  - Fill the suction line

Transport belts:

- Check transport belts for damage
- Eliminate any defects.

Safety devices:

- Check that protective covers and devices are present, are in proper condition and are firmly located.

Damages:

- Check the system for damages and soiling.
  - Repair any damage.
  - Eliminate soiling.

Retighten loose screws:

If you find any loose screw connections, tighten them immediately.

Tightening torques:

Thread	M10	M12	M16	M20	M24	M30
Tightening torque [Nm]	50	90	230	450	750	1450
[lf-ft]	(37)	66)	(170)	(332)	(553)	(1069)

Service openings:

All service openings must be firmly closed.

This applies particularly for

- Doors and flaps on the crusher
- Service flap on the discharge belt conveyor
- Service flap on the large belt guard

Vibrating screen:

A crude check of the oil level can be performed using the oil level hose. The hose is usually laid in the form of a loop and consequently enables an oil column to be seen even if the bearing is already empty.

- Ensure the machine is horizontal.
- Clean the oil hose
- Check oil level
- The oil column in the oil level hose must be significantly higher than the oil hose filling plug. If this is not the case, check the exact oil level (see section “Maintenance”).

Screen covers:

- Check for wear
- Visual inspection of screen covers.
  Note

Mesh cover:	signs of wear on welded hard coatings, bent profiles
Rubber cover:	thin sections, tears, holes
Wire mesh:	torn wires, holes, thin sections

- Replace the relevant cover if excessive wear is noted (see section “Maintenance”)

- Profile rubbers

- If the profile rubbers on the runners have slipped, move them back into their correct position immediately.
- Replace any damaged or missing profile rubbers immediately to prevent damage to the screen cover

Vibrating screen springs:

- Check that the vibrating screen springs are positioned correctly in the spring cups or on the spring bolts
- If the spring is not positioned correctly, or is defective or is missing entirely, remedy the situa-- tion accordingly (see section “Maintenance”)

4.3.2 Test run without material

When carrying out a test run without material, all machines are switched on in succession against the conveying direction. The correct functioning of each individual machine must be checked before swit-ching on the next machine.

If an error occurs, the system must be switched off immediately and the error eliminated.

⚠ WARNING!

Risk of injury to persons in the system’s danger area.

Persons who linger in the danger area during operation may be injured.

=>Before switching the system on, make sure that no persons are loca-t-ed in the system’s danger areas.

For information on the individual operating steps, please see the “Operation” chapter.

The performance of all test runs enables comprehensive checking of all important machine functions.

NOTE!

All emergency stop buttons must be released, otherwise it will not be possible to start the system.

Test run 1:

1. Select "Operation" operating mode
2. Switch on generator
3. Turn on main switch
4. Switch on control voltage Wait for start-up of the OP3 controller
5. Press the "Malfunction reset / emergency-stop" push button
6. Press the "Plant / Crusher ON" push button
   - Start-up warning sounds
   - Start release lamp lights up for approx. 300 seconds
7. Press the "Plant / Crusher ON" push button
   All drives run automatically on high
8. Observe the correct and proper functioning of the machines
9. Press the emergency-stop push button on the chassis
10. Monitor shutdown
    Crusher coasts down when shutting down, all other drives shut down immediately
11. Activate emergency stop
12. Switch off control voltage
13. Turn off main switch
14. Switch off generator

4.3.3 Test run “repair”

⚠ CAUTION!

Inadvertent start-up of a machine in repair mode can result in injuries and/or material jams.

Therefore only use the “Repair” operating mode in exceptional cases and with appropriate care.

1. Select “Repair” operating mode.
2. Switch on generator
3. Turn on main switch
4. Switch on control voltage
   Wait for build-up of the controller OP3
5. Press the “Emergency stop / malfunction reset” button
6. Push the “Installation / crusher on” button
   - Start-up warning sounds

- Start release lamp illuminates for approx. 300 seconds

NOTE!

Drives can only be switched while the start release lamp is illuminated.

7. Drives can be switched individually

5 Operation

5.1 Safety note

- Risk of fatal injury!
  When the system is running, people can be picked up and killed by machines.
  The power unit must be switched off before performing work on the system or eliminating material jams.
  - Wait for the crusher to coast down.
  - Protect the system from being re-started (lock the main switch).
  - Affix warning sign.
- Risk of injury to persons in the system's danger area.
  Persons who linger in the danger area during operation may be injured.
  =>Before switching the system on, make sure that no persons are located in the system's danger areas
- The (machine) operator is fully responsible for the safety of persons located in the danger area.
- Always wear personal protective gear to operate the system.
- All operating activities with the exception of "Move system" must be performed in the "Operation" mode => remove key from operating mode selector switch.
- After completion of work and during breaks, the machine must be switched off and the switch cabinet (control panel) locked.
- The machine may only be operated by trained and authorised persons.
- In dangerous situations for people or machines, press the closest emergency -stop immediately.
- Always keep switch cabinets and service doors closed.

⚠ DANGER!

Failure to observe the above safety instructions may result in serious injuries and endangering of persons, as well as damage to property; this is not covered by warranty.

5.2 Switch-on

Switch-on involves two different consecutive stages. Switch-on of the generator and switch-on of the complete system. The system can only be switched on when the generator is running. Sometimes it may be necessary to operate the generator on its own for maintenance work.

5.2.1 Switch on generator

- Key-operated switch on “Start”.

5.2.2 Switch on system

⚠ WARNING!

Risk of injury due to falling material!

Persons located beneath the feed area of the hopper or the discharge points of the belt conveyors can be injured by falling material.

- **Do not linger in the feed area of the hopper or in the discharge area of the belt conveyors.**
- **Wear a safety helmet.**

NOTE!

All emergency stop buttons must be released, otherwise it will not be possible to start the system.

Procedure

1. Select “Operation” operating mode
2. Switch on generator
3. Turn on the main switch
4. Switch on control voltage
   Wait for start-up of the controller OP3
5. Press “Emergency stop / malfunction reset” button
6. Press “Installation / crusher on” button
   - Start-up warning sounds
   - Start release lamp lights up for about 300 seconds
   - Drives can only be switched while the start release lamp is illuminated.
7. Press “Installation / crusher on” button
   All drive units start automatically

5.3 Switch-off

A distinction is also made between the system and the generator when switching off.

IMPORTANT!

The crusher must be run idle before switching off. Otherwise material jams and blockages can result.

5.3.1 Switch off the system

- Let the crusher run empty
- Press “Installation off” button
  - All drives disconnect in conveying direction
- Switch off control voltage
- Switch system off with the main switch
- Switch off generator

5.3.2 Switch off generator

IMPORTANT!

Motor should lag for at least 4 min in idle motion without load

= Cool down function.

- Turn key to the left => motor stop

5.4 Refueling

⚠ WARNING!

Fire hazard!

Fuel can ignite during refueling.

=>Smoking and naked light are not permitted during refueling.

5.5 Moving the system

The machine can be moved at any time, even with opened platforms and side discharge belt mounted.

⚠ CAUTION!

Damage to property!

The cardan shaft of the screen drive and magnetic belt can be damaged.

- **Before moving the system, fit transport safety devices to the magnetic belt and the screen frame**

⚠ WARNING!

Obscured system!

Because of the obscured system, persons in the traversing range can be fatally injured.

- **Always move the system with the help of a reliable marshaller**
- **Constant eye contact with the marshaller**

⚠ CAUTION!

Damage to property!

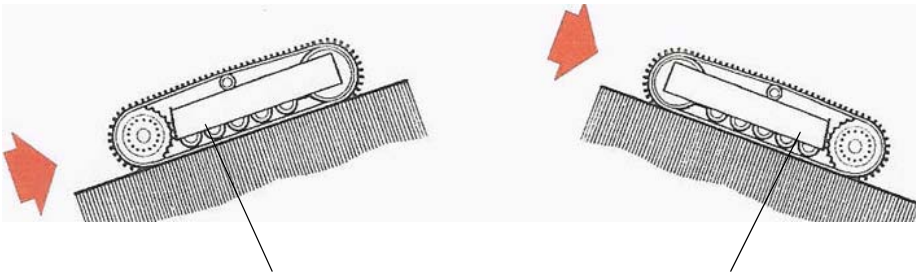
Chains can rust or freeze solid and break.

- **Move the system at least 10 m (33 ft) in each direction every day, in order to prevent seizing up**
- **Never drive the system if the chains are bogged down or frozen solid**

Important note on traversing uphill and downhill gradients:

NOTE!

For drive operation and large uphill or downhill gradients, a minimum tank filling quantity of approx. 300 l (80 gal) is required to prevent the motor from stalling.



Uphill gradients:
Drive at bottom

Downhill gradient:
Drive at bottom

5.5.1 Conditions

- Operate the conveyor belts until they are empty
- Detach earth connection
- Running gear must be clean (no dirt or stone between travelling wheels and track rollers)
  -> Risk of chain breakage
  -> Remove material caking
- Running gear must be free-running.
  Never drive the system if the chains are bogged down or frozen solid
- Chain must be tensioned

NOTE!

Ensure adequate ground clearance of the system!

- Travel way must be clear and free of obstacles
- Ground must be solid (note weight)
- Marshall must be appointed
- Drive uphill with the running wheel in front if possible, drive downhill with the drive wheel in front

5.5.2 Parking

- Park the machine on even, solid ground.
- If parking on a slope cannot be avoided, lock the chains firmly

5.5.3 Moving

⚠ CAUTION!

Danger of material damage!

The chain may slip from the drive or the wheel when moving or turning the plant.

The slipping of the chain reduces the service life of the chain and may lead to the malfunction of the gearbox and the hydraulic drive system.

- **Only operate when the chain is tensioned. Readjust the tension of the chain if necessary.**
- **Note the direction of movement when driving on slopes.**

NOTE!

Before moving the plant, the supporting elements of the classifying screen (optional) must be retracted. The retracted supporting elements actuate a position switch, which releases the plant's movement.

Moving with "drive system" valve block at the plant

- Start generator
- Turn on main switch
- Switch on control voltage
  - Wait for a start-up of the OP 3 controller
- Press the "Malfunction reset / emergency stop" push button
- Press the "Crusher / plant ON" push button
  - Start-up warning sounds
- Press "Hydraulics ON" push button
- Retract supporting elements
- Press the "Crusher / plant ON" push button
  - Crusher is running, wait for full start-up of the crusher
- Press the "Coupling" push button
- Moving The crawlers are set in motion using the two levers of the drive control. The left lever is for the left crawler, the right lever for the right crawler. The crawlers always move in the di-

rection in which the lever is moved. The speed is proportional to the movement of the levers.

- Press the "Coupling" push button

Moving using the radio remote control

- Start generator
- Turn on main switch
- Switch on control voltage

  - Wait for a start-up of the OP 3 controller
- Press the "Malfunction reset / emergency-stop" push button
- Press the "Crusher / plant ON" push button

  - Start-up warning sounds
- Press "Hydraulics ON" push button
- Retract supporting elements
- Press the "Crusher / plant ON" push button

  - Crusher is running, wait for full start-up of the crusher
- Press the "Coupling" push button
- Turn the radio monitoring switch to "Radio ON"
- Switch on hand-held transmitter

  - activate rotary knob on the side

  - activate emergency stop

  - reset emergency-stop (green button on the side)
- Moving The crawlers are set in motion using the two levers of the radio remote control. The left lever is for the left crawler, the right lever for the right crawler. The crawlers always move in the direction in which the lever is moved. The speed is proportional to the movement of the levers.
- Press the "Coupling" push button

5.6 Crushing
Important information for the system operator!

- Risk of fatal injury due to falling rocks!
  Rock falls can occur in the area of the feed hopper during charging.
  Make sure that no persons are located in the danger area.
- Risk of fatal injury!
  There is a risk of fatal injury when eliminating material jams in the running crusher.

  - Never eliminate material jams by hand or with objects when the crusher is running.

  - Do not climb into the vibrating screen or vibrating conveyor feed chute.

  - Never open the service doors while the crusher is running.
- Risk of injury due to moving gap adjuster!
  In the event of overload, the gap adjusters draw back.
  Lingering in the area of the gap adjuster is not permitted.
- Damage to the drive and control elements!

Never start the crusher drive when the crusher is jammed.
Before starting the crusher, always check that the crushing chamber is empty. If it contains ma--terial, empty it.

- Material jams and blockages!
  In order to avoid material jams, only feed material of the specified feed size.
- Danger of damage to the feeding devices!
  Never loosen blockages in the area of the material feed with an excavator or shovel loader.
- Danger of damage to the frequency converter!
  After switching off the feed chute after an overload, NEVER switch on the chute prematurely via the control panel or radio remote control.
  The chute may only be switched on again after it has come to a complete standstill.
- Charge the feed chute in such a way that a material bed always remains on the chute base. Repeated charging of the chute when empty will result in deformation of the chute base and premature failure of the drive units.
- Damage to property!
  Incorrect charging or incorrect starting of the feed chute will result in the chute constantly swit-ching on and off. This maloperation can cause damage to the frequency converter and / or the vibration motors.Adjust the feed chute and material quantity with the frequency converter so that the automatic shut-down device only actuates in extreme cases (maximum 10 times per hour acceptable).

⚠ DANGER!

Failure to observe the above safety instructions may result in serious in--juries and endangering of persons, as well as damage to property; this is not covered by warranty.

5.7 Starting the crusher process

⚠ WARNING!

Risk of injury!

Before starting the system, make sure that no persons in the vicinity can be put at risk. Warn all persons in the vicinity before starting up the system.

⚠ CAUTION!

Damage to the drive and control elements.

Never start the crusher drive when the crusher is jammed.

Before starting the crusher, always check that the crushing chamber is empty. If it contains material, empty it.

1. Select "Operation" operating mode
2. Switch on generator
3. Turn on main switch
4. Switch on control voltage
   - Wait for start-up of the OP3 controller
5. Press the "Malfunction reset / emergency-stop" push button
6. Press the "Plant / Crusher ON" push button
   - Start-up warning sounds
   - Start release lamp lights up for approx. 300 seconds
7. Press the "Plant / Crusher ON" push button
   - All drives run automatically on high
8. Observe the correct and proper functioning of the machine
9. Feed material
10. Crush

5.8 Charging

⚠ WARNING!

Risk of fatal injury!

Incorrect charging can result in blockages or overfilling of the crusher! Incorrect elimination of such faults can result in fatal injury.

- **Never eliminate blockages when the crusher is running.**
- **Always maintain a safe distance from the machine, so that there is no danger from the feed material.**
- **Lingering in the area of the crushing jaw during operation is strictly forbidden.**
- **Never reach into the running crusher with bars or the like.**

⚠ CAUTION!

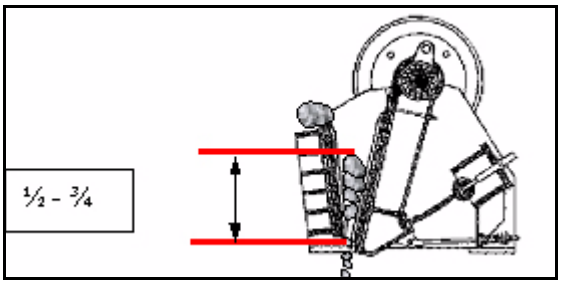
Damage to the feed unit!

Constantly overfilling the crusher can result in premature wear or dam-a-ge to feed units (inlet chamber, screen or chute).

- **Ensure uniform feeding of the material to be crushed**

The prerequisites for fault-free operation and optimal performance of the crusher are

- Uniform feeding of the material to be crushed
  (crushing jaw ½ to ¾ full)



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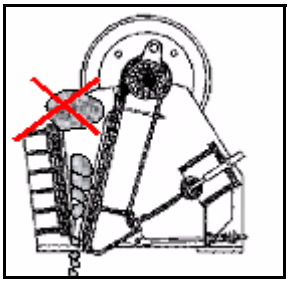
- Feed material must be smaller than the crushing jaw
  (over-large pieces will result in jams and damage to the crusher).



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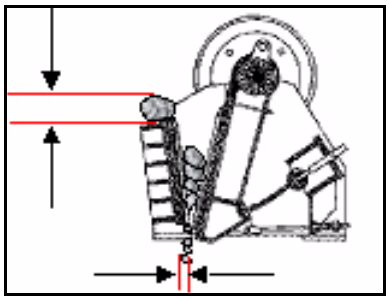
- Ratio of feed material to end particle should be **max. 7:1**



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5.8.1 Elimination of jams

⚠ WARNING!

Risk of fatal injury!

There is a risk of fatal injury when eliminating material jams in the run-- ning crusher.

- **Never eliminate material jams by hand or with objects when the crus-h- er is running.**
- **Do not climb into the vibrating screen or vibrating conveyor feed chu-te.**
- **Never open the service doors while the crusher is running.**

⚠ CAUTION!

Damage to the drive and control elements.

Never start the crusher drive when the crusher is jammed.

Before starting the crusher, always check that the crushing chamber is empty. If it contains material, empty it.

⚠ CAUTION!

Danger of damage to the feeding devices!

Never loosen blockages in the area of the material feed with an excavator or shovel loader.

NOTE!

The crusher operating mode (forward / back) may only be changed while the crusher is stopped.

- In the event of jams in the crusher proceed with the utmost caution. Before eliminating the jam, switch the machine off and protect against re-starting.

5.8.2 Clearing stockpiles

The height and volume of the stockpiles must be monitored. The stockpile must not extend as far as the system. The distance between stockpile and conveyor belt must be at least 250 mm (8.2 ft.

If wheel loaders are used for clearing, take care not to damage the system.

5.8.3 Recycling

Demolition materials, concrete, asphalt etc. must be thoroughly prepared before charging.

- Metal objects must be removed before they reach the crusher.
- Cut concrete reinforcements to a length of < 1m (3 ft).
  Over-long reinforcements can cause damage to the crusher or the conveying devices.

The most effective mode of operation consists in preparation of the feed material.

5.8.4 Winter operation

NOTE!

In the event of frost there is a risk of seals and scrapers freezing.

Before switching the system on, always check the free movement of scrapers and seals that come into contact with moving parts.

IMPORTANT!

Check antifreeze and cooling water in the motor.

5.9 Adjustment / Set-up

This chapter describes basic adjustments and settings that enable you to achieve the desired crus-hing performance and crushing result.

5.9.1 Check gap width (Crusher)

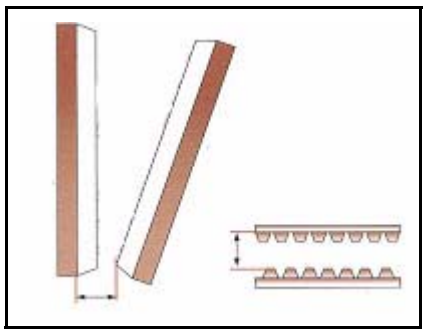
DANGER!

Risk of fatal injury!

There is a risk of the operator being picked up and killed when the crus-her is running or starting up.

- **Never climb beneath a running crusher.**
- **Wait for the crusher to coast down (coast-down approx. 3-4 min.)**
- **Protect crusher against re-starting (lock main switch)**
- **Affix warning sign**

Measure gap (widest point) - distance between tooth crest and tooth gullet.



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Min. and max. gap setting		
Crusher type	**Crushing jaw**	**Gap width**
SStR 400 x 265	**400 mm x 265 mm (15.7 in x 10.4 in)**	**15-50 mm (0.6-2.0 in)**
SStR 600 x 400	**600 mm x 400 mm (23.6 in x 15.7 in)**	**35-85 mm (1.4-3.3 in)**
SStR 700 x 400	**700 mm x 400 mm (27.6 in x 15.7 in)**	**35-85 mm (1.4-3.3 in)**
SStR 800 x 500	**800 mm x 500 mm (31.5 in x 19.7 in)**	**45-95 mm (1.8-3.7 in)**
SStR 800 x 625	**800 mm x 625 mm (31.5 in x 24.6 in)**	**50-125 mm (2.0-4.9 in)**
SStR 940 x 500	**940 mm x 500 mm (37.0 in x 19.7 in)**	**40-90 mm (1.6-3.5 in)**
SStR 1000 x 630	**1000 mm x 630 mm (39.4 in x 24.8 in**	**50-100 mm (2.0-3.9 in)**
SStR 1000 x 840	**1000 mm x 840 mm (39.4 in x 33.1 in)**	**120-200 mm (4.7-7.9 in)**
SStR 1100 x 700	**1100 mm x 700 mm (43.3 in x 27.6 in)**	**60-130 mm (2.4-5.1 in)**
SStR 1200 x 800	**1200 mm x 800 mm (47.2 in x 31.5 in)**	**75-135 mm (3.0-5.3 in)**
SStR 1250 x 1000	**1250 mm x 1000 mm (49.2 in x 39.4 in)**	**140-250 mm (5.5-9.8 in)**
SStR 1400 x 1130	**1380 mm x 1130 mm (55.1 in x 44.5 in)**	**140-250 mm (5.5-9.8 in)**

⚠ CAUTION!

Damage to property!

Failure to observe the preset gap dimension can result in increased wear or damage to the crusher; this is not covered by warranty!

- **The preset gap dimension must be observed.**

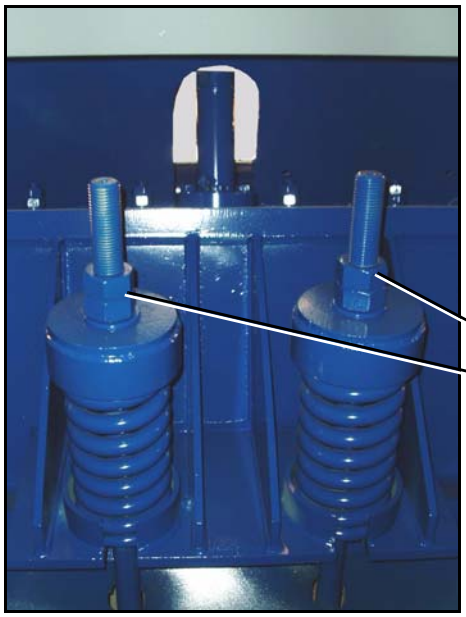
5.9.2 Adjusting the gap width (crusher)

⚠ CAUTION!

Danger of material damage!

Gap setting when the crusher is charged may damage the gap setting.

- **Only perform gap setting when the crusher is empty.**



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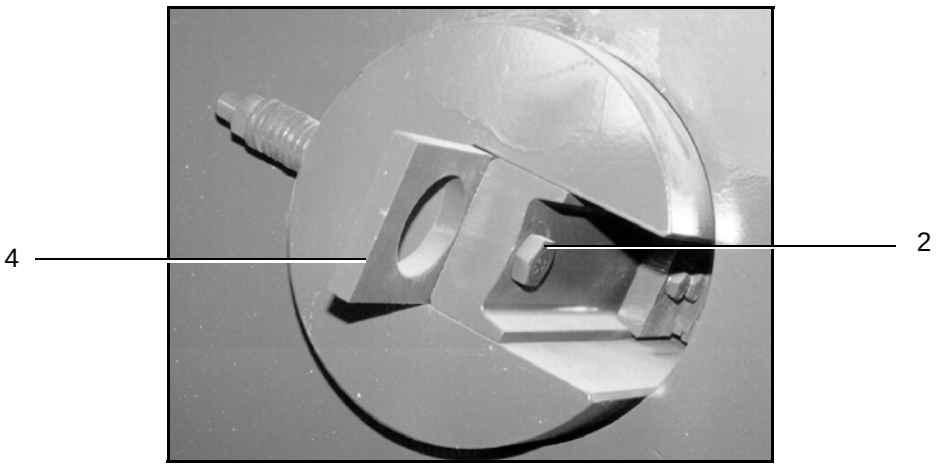
- Release the tension in the springs by loosening the nuts (1) on the pull rods



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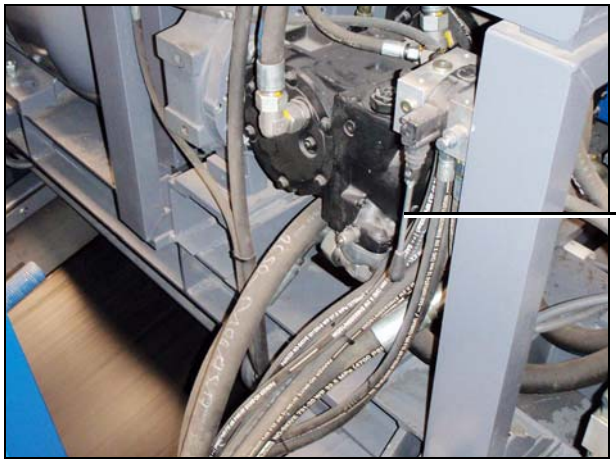
- Remove the screws (2) of the gap setting
- Switch on the hydraulics



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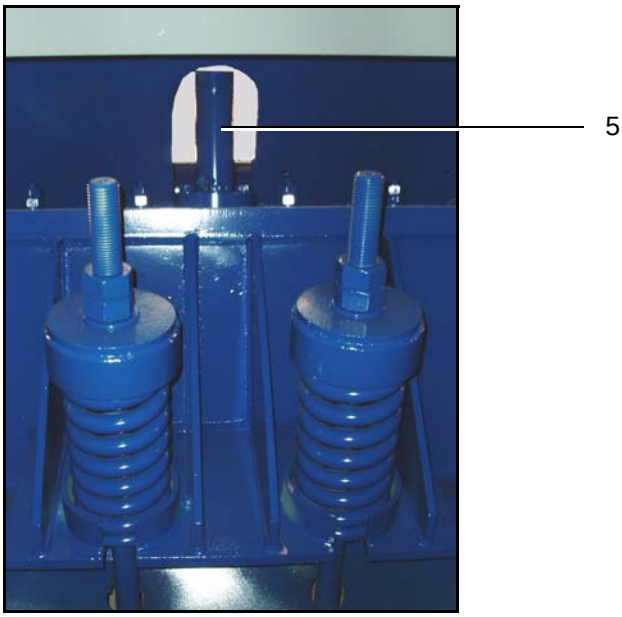
- Push the rocker forward using the valve block (3)
- Insert shim (4) -> reduces the gap
  Remove shim -> increases gap
- Move the rocker back using the valve block (3)



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IMPORTANT!

Move the hydraulic cylinder (5) of the gap setting back completely.

- Pretension the springs equally
- Fit screws

IMPORTANT!

Do not pretension springs on the block.

- Carry out crusher test run

IMPORTANT!

If a knocking sound can be heard in the area of the pressure plate bearing during the test run, increase the pretensioning of the springs until the pressure plate makes no noise.

5.10 Water pump (option)

⚠ CAUTION!

Damage to property!

Operating the water pump without water will damage it.

Contaminated water will damage the water pump.

Such damages are not covered by warranty.

Only operate the water pump with clean water.

⚠ CAUTION!

Damage to property!

Freezing water can cause damage to the water pump.

If there is a risk of frost, drain the water pump completely.

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Suction operation

When operating the water pump in suction mode (e.g. suction of water tanks), please note the follo-w-ing points:

- Tank and water must be clean
- Suction line maximum 5 m (16 ft) long
- Fill water pump with water before putting into operation
- Water may only be fed to the water pump via a filter installed on-site

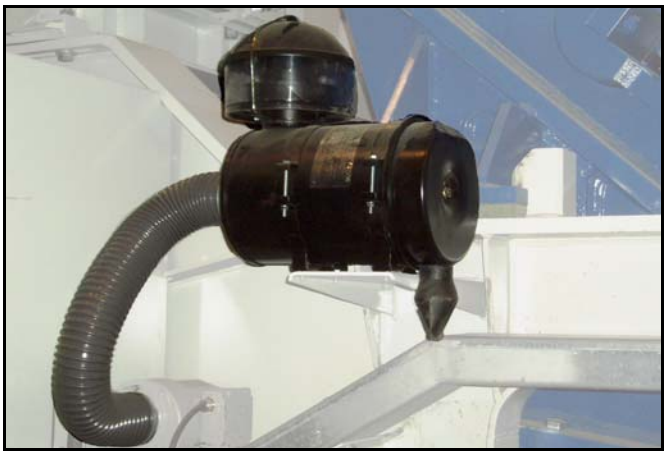
Operation via existing water system

Maximum pressure of the water system: 4 bar (58 psi)

Operation

- Switch water pump on and off with the button on the switch cabinet
- Switch desired spraying on and off with relevant lever

5.11 Switch cabinet overpressure system



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The overpressure system builds up an overpressure in the electrical switch cabinet. As a result, no dust penetrates the electrical switch cabinet. The overpressure system only functions if no leaks are present.

- Keep the switch cabinet properly closed during operation
- Regularly check the air hoses for damage and replace if necessary
- Clean the air filter at least once a week, more often if necessary

6 Maintenance

6.1 Safety information

⚠ WARNING!

Risk of fatal injury!

Only carry out repair work or maintenance work when machine is turned off!

- **Safeguard against unauthorised start-up of machine:**
- **Lock switch cabinet**
- **Switch off and lock main switch.**
- **Attach warning sign against restart.**

NOTE!

Those responsible must ensure that during maintenance work, machine is inoperative and they must safeguard the machine against its unau-tho-rised restart.

IMPORTANT!

Ensure that all work is carried out with the utmost cleanliness.

Throttle valves and pressure relief valves set by Kleemann GmbH may only be changed by personnel trained by Kleemann. It is forbidden to remove seals from safety valves.

Work on the crushing machine or hydraulics system must only be carried out when the machine has been switched off.

6.2 Maintenance plan

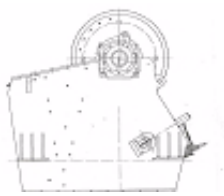
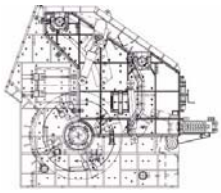
Maintenance work	First time	Interval Period	Interval h	At least
Jaw crusher				
Relubricate bearings			100h	
Lubricate labyrinths			50h	
Check V-belts and if necessary tension them	50h	monthly		
Listen to bearings, check temperature rise		daily		
Check fastening of the crushing jaws and side wedges	Start-up	as required		
Check fastening of the crusher	Start-up			
Vibrating screen				
Check screen linings (wear and tear + ten-si-on)		daily		
Listen to bearings, check temperature rise		daily		
Checking oil level		daily		
Oil change	500h / 1/2 year		1000h	yearly
Lubricate screening machine (grease)			50h	
Retighten universal joint shaft screws	50h			yearly
Lubricate universal joint shaft			50h	
Retighten screws of the screen bearing	50h			yearly
Check swing amplitude	Start-up	monthly		
Change oil in the bevel gear system			10000h	
Swinging conveying chutes				
Check junction boxes for leakproofness			100h	
Check fastening of the vibration motors	50h		500h	
Lubricate vibration motors	see separate operating instructions			

Maintenance work	First time	Interval Period	Interval h	At least
Belt conveyor				
Check conveyor belts		daily		
Readjust scraper rubber		as required		
Readjust sealing rubber		as required		
Change oil in belt drives	500h		2000h	1.5 year
Main discharge belt (reversal pulley)			50h	
Pedestal bearing grease change (side di-s-charge belt/main discharge belt drive)			2000h	2 year
Check sealing lips of the pedestal bearings		weekly		
Hydraulics				
Check hydraulic lines for leakproofness and damage	100h	as required		
Replace return filter	500h		1000h	
Replace suction filter	500h		1000h	
Check oil level hydraulics		daily		
Oil change and/or oil analysis hydraulics	500h		2000h	
Caterpillar track				
Oil level check transfer gearbox		monthly		
Oil change transfer gearbox	500h		2000h	2 year
Oil level check planetary gearbox		monthly	200h	
Oil change planetary gearbox	200h		2000h	yearly
Check chain tension		as required		
Check leakproofness of the gearbox		daily		
Fastening of the rollers		monthly		
Fastening of the base plates		monthly		

Maintenance work	First time	Interval Period	Interval h	At least
Electric cabinet				
Clean control cabinet		as required		
Clips and connecting screws	50h	as required		
Replace sealing rubber on control cabinet doors				yearly
Check pneumatic spring rubber pressure		3 months		
Overpressure system control cabinet				
Check function/hoses		daily		
Clean the air filters		weekly		
General				
Leakage detection		daily		
Retighten screwed joints		as required		
Replace defective lubrication nipples		as required		
Check hydraulics for leakproofness		daily		
Check electric control lamps (if applicable)		daily		
Check EMERGENCY STOP		daily		
Diesel generating set				
See separate instructions				
Magnetic separator				
See separate instructions				

6.3 Operating supplies

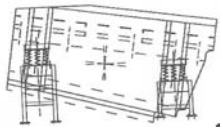
6.3.1 Crusher lubricant table

Brecher / crusher / broyeur			
 *0000100*		 *0000510*	
Schmierstoff **Lubricant** **Genre de lubricant**	**Öl / oil / huile**		**Fett / grease / graisse**
Umgebungstemperatur **Ambient temperature** **Temperature ambiante**			
	+35 ... +50 °C **+95 ... +122 °F**	**-5 ... +35 °C** **+23 ... +95 °F**	**-30 ... +60 °C** **-22 ... +140 °F**
Hersteller / Manufacturer / Fa-bricant			
ARAL			**Aralus HLP2**
BP			**Energrease LS-EP 2**
CALYPSOL			**H 443**
CASTROL			**-**
ESSO			**Beacon EP 2**
MOBIL			**Mobigrease Special**
SHELL			**Alvania EP 2**
TEXACO			**Multifak EP 2**

We can only guarantee perfect operation of our machines if the lubricants specified above are used.

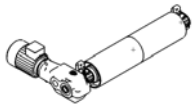
The order in which the mineral oil companies are listed bears no relation to the quality of the products.

6.3.2 Lubricant table for screen

Sieb / screen / crible			
 *0000109*			
Schmierstoff **Sort of lubricant** **Genre de lubricant**	**Öl / oil / huile**		**Fett / grease / graisse**
Umgebungstemperatur **Ambient temperature** **Temperature ambiante**			
	+35 °C .. +50 °C 95 °F ... 122 °F	-5 °C ... +35 °C +23 °F ... + 95 °F	-30...+60 °C -22 °F ... +140 °F
Hersteller / Producer / Fabricant			
ARAL	**Degol BG 114**	**Degol BG 68**	**Aralus HLP2**
BP	**Energol GPX100**	**Energol GPX68**	**-**
CALYPSOL	**Bison 114**		**-**
CASTROL	**Alpha 100**	**Alpha SP 68**	**-**
ESSO	**Spartan 100**	**Spartan 68**	**-**
MOBIL	**Mobilgear 627**	**Mobilgear 626**	**Mobilux EP 2**
SHELL	**Omala 100**	**Omala 68**	**Alvania EP2**
TEXACO	**Meropa 100**	**Meropa 68**	**-**

We only guarantee the proper operation of our machines when the above-stated lubricants are used.
The order of the listed petroleum companies does not reflect the quality of the products.

6.3.3 Belt drive lubricant table

Bandantrieb / Belt Drive / Entraînement bande Pumpenverteilergetriebe / Pump distribution gear / Boîte de transfert de pompe				
Schmierstoff **Lubricant** **Genre de lubricant**	**Öl / oil / huile**			**Fett / grease / graisse**
	CLP **DIN 51 517** **mineralisch / mineral / minérale**		**PGLP** **DIN 51 502** **synthetisch / synthetic / synthétique**	
Umgebungs-temperatur **Ambient temperature** **Temperature ambiante**				
	+5 ... +45 °C **+41 ... 113 °F**	**-5 ... +35 °C** **+23 ... +95 °F**	**-25 ... +80 °C** **-13 ... +176 °F**	**-30 ... +60 °C** **-22 ... +140 °F**
Hersteller / Manufacturer / Fabricant				
ARAL	**Degol BG 460**	**Degol BG 220**	**Degol GS 220**	**Aralub HL 2**
BP	**Energol GR-XP 460**	**Energol GR-XP 220**	**Energol SG-XP 220**	**L 2**
CALYPSOL	**UK-ECUBSOL 8140**	**UK-ECUBSOL 8050**	**UK-ECUSYNTH PG 220**	**Calypsol H 441**
CASTROL	**Alpha SP 460**	**Alpha SP 220**	**Alphasyn T 220**	**Spheerol AP 2**
CHEVRON	**NL-Gear Compound 460**	**NL-Gear Compound 220**	**-**	**Dura-Lith EP Grease 2**
ESSO	**Spartan EP 460**	**Spartan EP 220**	**EZL 502**	**Beacon 2**
KLÜBER	**LAMORA 460**	**LAMORA 220**	**SYNTHESO HT 220**	**CENTOPLEX 2 EP**
MOBIL	**Mobilgear 643**	**Mobilgear 63**	**Mobile Glygoyle 30**	**Mobilgrease MP**
SHELL	**Shell Omala 460**	**Shell Omala 220**	**Shell Tivela Oil WB**	**Alvania G 2**
TEXACO	**Meropa 460**	**Meropa 220**	**Synlube CLP 220**	**Multifak R**

We can only guarantee perfect operation of our machines if the lubricants specified above are used.

The order in which the mineral oil companies are listed bears no relation to the quality of the products.

6.3.4 Lubricant table for crawler running gear

Planetengetriebe (Raupenfahrwerk) / Planetary Gear (caterpillar track) / Engrenage planétaire (châssis a chenilles)			
Schmierstoff Sort of lubricant Genre de lubrifiant	**Öl / oil / huile**		**Fett / grease / graisse**
	ISO VG 150	**ISO VG 220**	
Umgebungstemperatur Ambient temperature Température ambiante			
	+5 ... +65 °C +41 ... +149 °F	**-5 ... +65 °C +23 ... +149 °F**	
Hersteller / Producer / Fabricant			
ARAL	**Degol BG 150**	**Degol BG 220**	**-**
BP	**Energol GR-XP 150**	**Energol GR-XP 220**	**-**
CALYPSOL	**-**	**-**	**-**
CASTROL	**Alpha SP 150**	**Alphasyn SP 220**	**-**
CHEVRON	**NL-Gear Compound 150**	**NL-Gear Compound 220**	**-**
ESSO	**Spartan EP 150**	**Spartan EP 220**	**-**
KLÜBER	**-**	**-**	**-**
MOBIL	**GF 629 Mobilgear 629**	**GF 630 Mobilgear 630**	**-**
SHELL	**Shell Omala EP 150**	**Shell Omala EP 220**	**-**
TEXACO	**Meropa 150**	**-**	**-**

We can only guarantee perfect operation of our machines if the lubricants specified above are used.
The order in which the mineral oil companies are listed bears no relation to the quality of the products.

6.3.5 Lubricant table for hydraulic driving system / Auxiliary hydraulics

Fahrhydraulik / Zusatzhydraulik Hydraulic driving system / Auxiliary hydraulics		
Schmierstoff **Lubricant** **Genre de lubricant**	**Öl / oil / huile**	**Fett / grease / graisse**
Umgebungstemperatur **Ambient temperature** **Temperature ambiante**		
	-5 ...+35 °C **23 °F ... +95 °F**	
Hersteller / Manufacturer / Fabricant		
Hydrostar HES **Synth. multigrade hydraulic oil**	**AFNOR NFE 46 HV HLP** **VG 22-68**	**-**
Fuchs	**Plantosyn 3268 ECO**	

We can only guarantee perfect operation of our machines if the lubricants specified above are used.
The order in which the mineral oil companies are listed bears no relation to the quality of the products.

6.4 General maintenance tasks

6.4.1 Testing the EMERGENCY STOP

⚠ WARNING!

The functioning of the emergency stop buttons must be checked daily.

The emergency stop function must be tested without material. Otherwise the immediate switch-off of all belts and conveyors will block the crusher or belts. Eliminating obstructions causes unnecessary additional hazards.

Checks:

- Run the machine at idle speed
- Switch on the crusher, all belts and conveyors
- Press an emergency stop button
- Machine must switch off immediately
  Delay on the crusher: 60 seconds
- In the case of emergency stop at the switch cabinet:
  Diesel generator is switched off immediately
- Release the emergency stop button again

6.4.2 Retightening screw connections

If loose screw connections are identified during inspection and maintenance work or during the machine's operation, they must be retightened immediately. See table for tightening torques.

In addition, after certain maintenance and repair work the respective screws must be retightened after a specific service life. The details can be found in the specifications.

Screw 8.8	M10	M12	M16	M20	M24	M30
Torques Nm (lb ft)	**51 Nm (38 lb ft)**	**87 Nm (65 lb ft)**	**214 Nm (158 lb ft)**	**430 Nm (318 lb ft)**	**743 Nm (548 lb ft)**	**1350 Nm (996 lb ft)**

6.4.3 Check hydraulics for leaks

DANGER!

Danger of serious physical injury!

Hydraulic fluid is under high pressure. When working on the hydraulic system, squirting hydraulic oil can result in very serious eye injuries or other injuries.

- **Only tighten screw fittings and connections when the system is depressurised.**

- Regularly check all hydraulic lines, hydraulic cylinders, hydraulic pumps and oil tanks for oil loss and leaks.
- Tighten or replace leaky screw connections.
- Replace cracked or brittle hoses.
- Repair or replace leaky hydraulic components.
- Regularly free the oil tank vent of dirt and dust, in order to avoid obstruction.

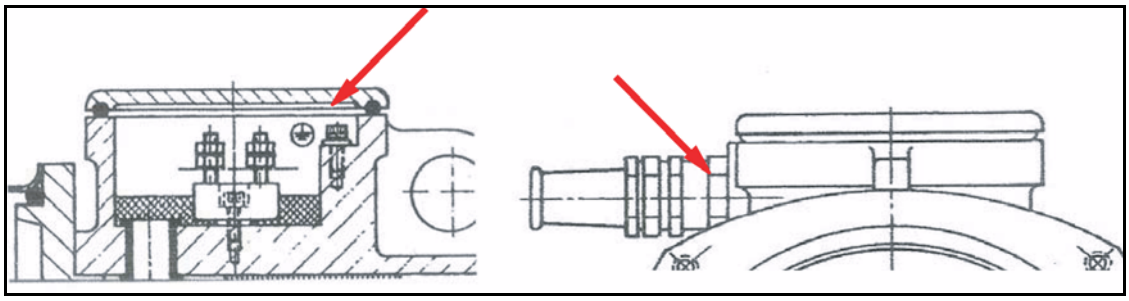
6.4.4 Testing the electrical indicator lights

Testing the indicator lights is necessary to guarantee reliable verification of the machine's operating state. Defective lamps can cause false assumptions, resulting in considerable danger.

6.5 Vibrating conveyor chutes

6.5.1 Terminal box (electric motor)

Loose terminal box covers and cable entries can result in contact problems and short-circuits due to the penetration of water. Parts **must be regularly** checked for firm positioning and leaks.



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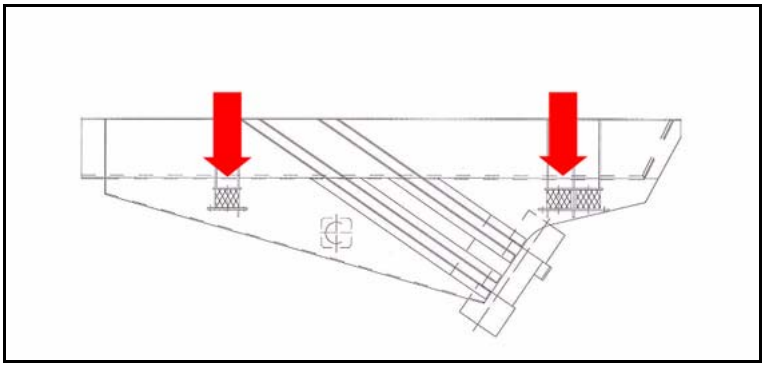
6.5.2 Checking the rubber buffers



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⚠ WARNING!

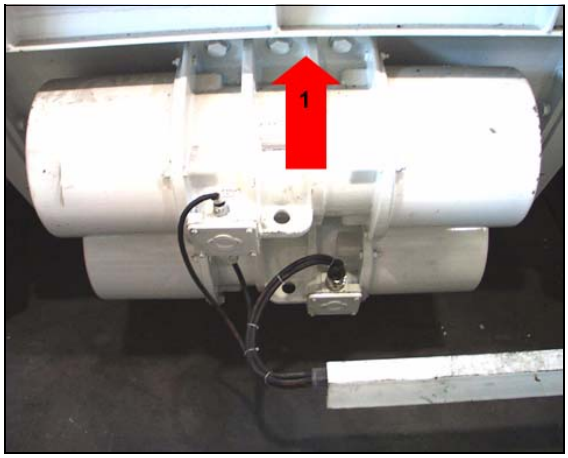
Danger due to defective rubber buffers!

Check the rubber buffers for damage regularly.

Replace defective rubber buffers immediately.

6.5.3 Checking the fixing of the vibration motors

The mounting screws (1) of the vibration motors must be regularly checked, as they are subject to heavy alternating loads and can consequently become loose. The transfer of vibration forces cannot be guaranteed with loose screw connections, and premature damage to the vibration motors can be expected.



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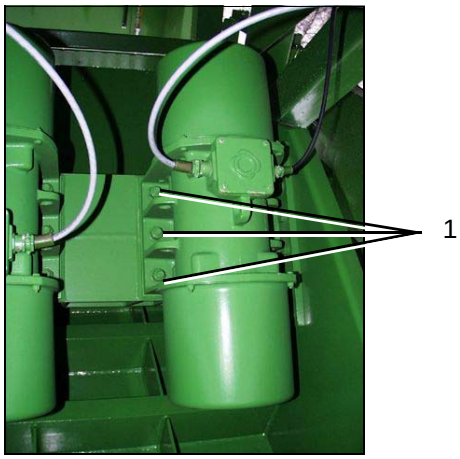

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- Switch the system off and lock the main switch
- Tighten all mounting screws (1) with a torque wrench

Thread	M10	M12	M16	M20	M24	M30
Tightening torque [Nm]	50	90	230	450	750	1450
[lb ft]	(37)	(66)	(170)	(332)	(553)	(1069)

DANGER!

Risk of fatal injury due to spraying parts!

Material can be thrown off uncontrolled in all directions by unprotected vibration motors.

Only operate the system with protective covers.

CAUTION!

Damage to property due to penetrating water or dust!

Unprotected vibration motors can fail prematurely. Water or dust can cause bearing damage and interwinding faults.

- **Only operate the system with protective covers**
- **Replace defective protective covers immediately**

6.5.4 Lubricating the vibration motors

See “Vibration Motors” operating instructions.

6.6 Vibrating screen

6.6.1 Checking screen liners (wear and tear + tension)

NOTE!

Screen liners are specially adapted to customer requirements, and are thus special parts. Please order these parts in good time (delivery time).

Wear and tear inspection:
Wear and tear of screen liners can only be recognised by visual inspection. In addition, liners must be tested for the following:

Grid liner:	**Signs of wear and tear of welded-on hard layers, twisted profiles**
Rubber liner:	**Thin areas, cracks, holes**
Wire mesh:	**Torn off wires, holes, thin areas**

- In the case of severe wear and tear replace the respective liner.

Checking for tension:

⚠ WARNING!

Risk of fatal injury by moving and rotating machine parts!

When inspecting machine during its operation there is a high accident risk caused by getting caught and objects becoming coiled around mo-v-ing parts.

- **Inspections must only be carried out by qualified and competent per--sons.**
- **Only approach machine if machine poses no hazard.**

Screen's tension is best checked by listening.

Important

- Screen liner must be fitted neatly over entire area of screen frame.
- Ensure screen is completely empty so that any interfering noise is kept to a minimum.

Listen out for the following noises:

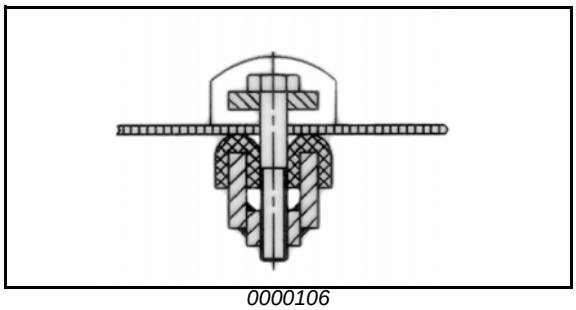
Grid liner :	**Rattling of screws or the entire screen liner**
Rubber liner :	**Knocking of the liner**
Wire mesh:	**Rattling of the screen liner**

- Should one of these noises occur, tighten or tension respective liner. Loose liners cause flap--ping cracks and damage to machine!

Liners and fastening screws can also be tested for security by tapping. However, it is **imperative that this is carried out when the machine is stationary.**

6.6.2 Clamping systems

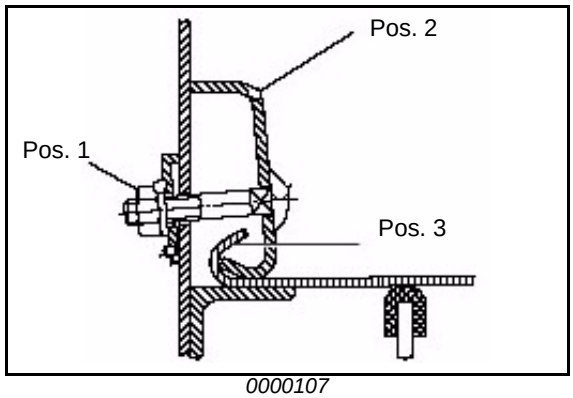
Central clamp



0000106

- **Unclamp screen liner along length of screen.**

Transverse clamping



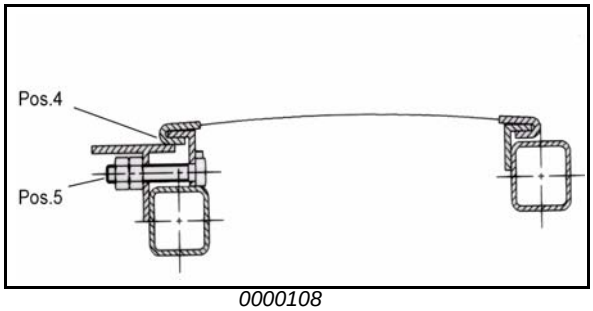
0000107

- **Using a screw (pos. 1) press clamping bracket (pos. 2) into transverse clamping folds of screen liner (pos. 3). Screen liner is thus clamped between side walls, trans-ver-se to direction of flow.**

IMPORTANT!

If screen liner is fitted with both central and transverse clamps, central clamps are unclamped first. Afterwards liner is clamped at bracket (pos. 2) between side walls.

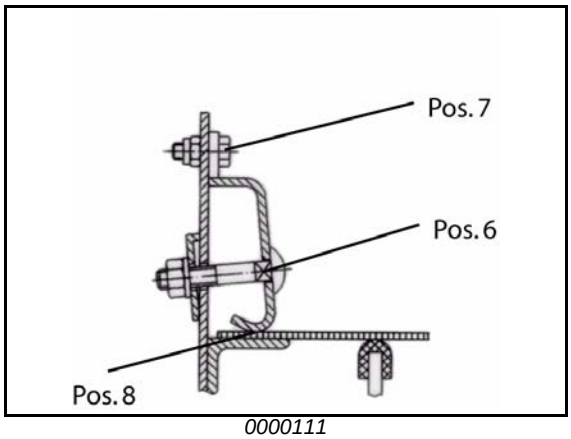
Longitudinal clamp



0000108

- **Screen liner is designed with a clamping fold. Clamping folds are inserted into bra-cket and moving clamping rail (pos. 4). Screen liner is clamped in direction of flow using screws (pos. 5) at clamping rail.**

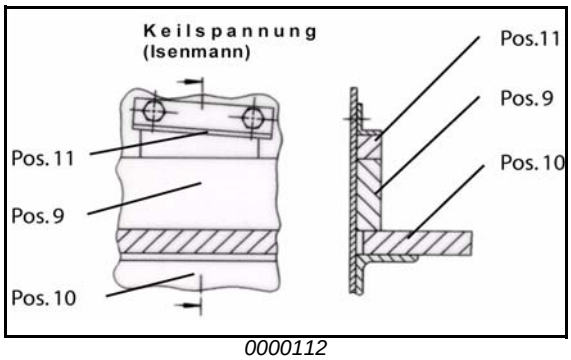
Wedge clamp



0000111

- **Screen liner is fixed onto frame with a clam-p-ing bracket (pos. 6) and contact stop (pos. 7). Contact stop can be mounted in two different positions due to its excentric drill hole. Depending on thickness of screen bea-ring, contact stop might have to be rotat-ed.**

  Secure screen bearing using screws (pos. 8) at clamping bracket (pos. 6).



0000112

- **A wedge (pos.9) is driven between contact stop (pos. 10) and wedge angle (pos. 11). Screen liner is thereby secured on frame.**

6.6.3 Oil service for vibrating screen

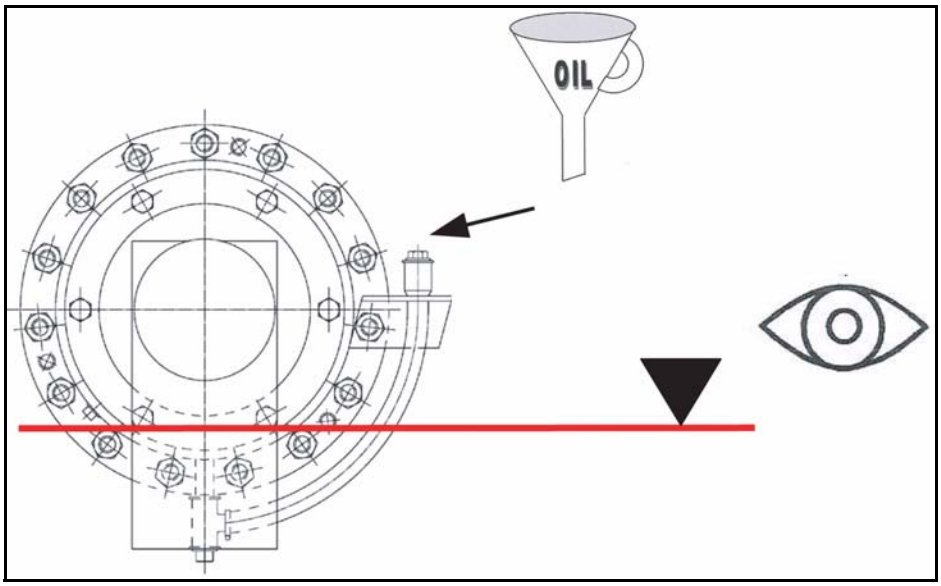
Note:

- Only carry out oil checks when machine is at operating temperature.
- Machine must be horizontal.
- Use correct oil.

Checking oil level:

A rough oil level check can be carried out using oil level hose. The hose is fitted like a siphon. Thus an oil column also indicates when the bearing is almost empty.

- Oil column in oil level hose is clearly above connection seal
  ⇒ Oil level ok
- Oil column in oil level hose is same as connection seal or lower
  ⇒ Carry out precise oil level check



0000113

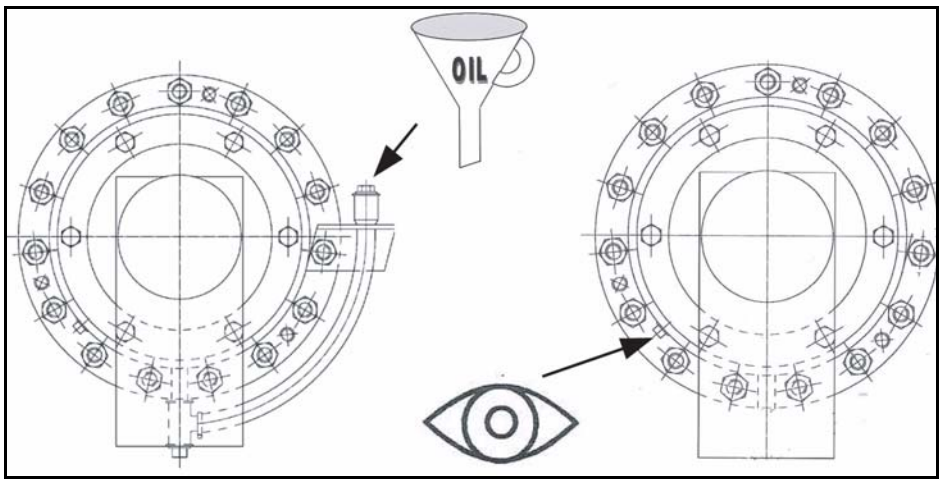
Precise oil level check:

- Remove dirt from inspection plug area.
- Remove inspection plug.
- Oil must emerge from inspection hole.
  ⇒ If no oil emerges, then oil must be added.

Adding oil: (as required)

- Place collecting container under inspection plug.
- Remove inspection plug and filler plug.
- Add oil into filler hose until it emerges from inspection plug.
- As oil is slowly distributed to both sides of the bearing, a precise oil level check must be carried

out roughly half hour after filling.



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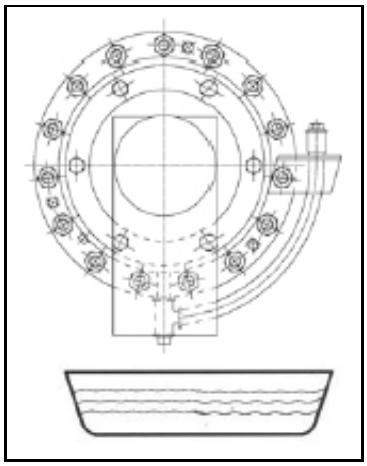
NOTE!

As oil is slowly distributed to both sides of the bearing a precise oil level check must be carried out roughly half hour after filling.

Changing oil:

- Place a suitable oil collecting container (minimum 20 L (5.3 gal)) under drain plug.



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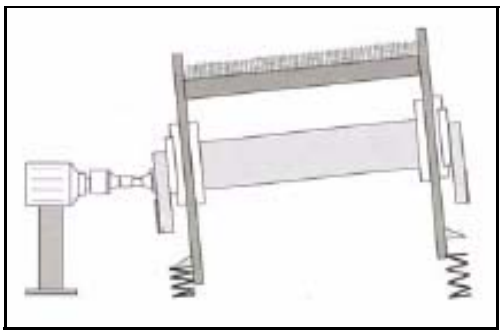
- Remove drain plug (fitted on both sides) ⇒ Drain oil.
- Tilt screener for complete draining.



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- Add oil (see section "Adding oil").

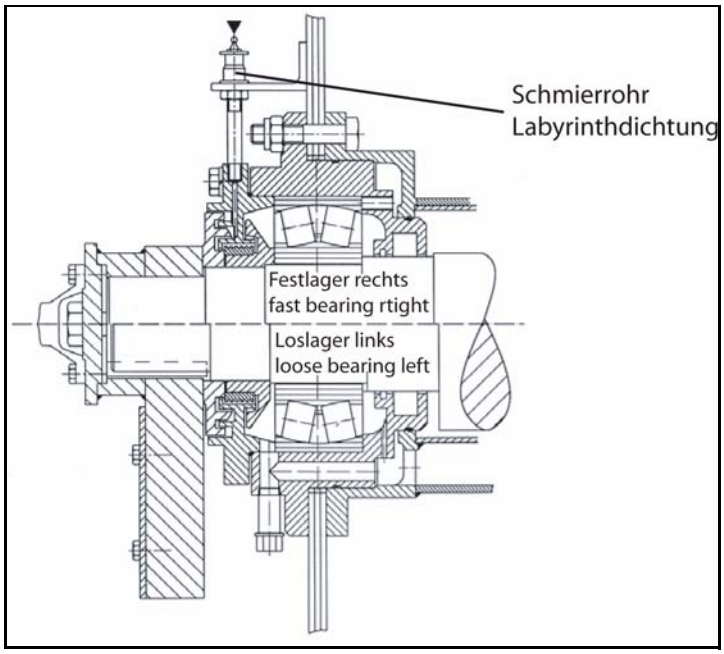
6.6.4 Lubricating vibrating screen (grease)

Lubricating screener with grease is limited to greasing labyrinth seals and universal joint shaft.

External labyrinths of both bearings must be lubricated.

External labyrinths

- Grease respective labyrinth using a grease gun (anti-friction bearing grease) until 1 cm (0.4 in) of grease emerges from gap.



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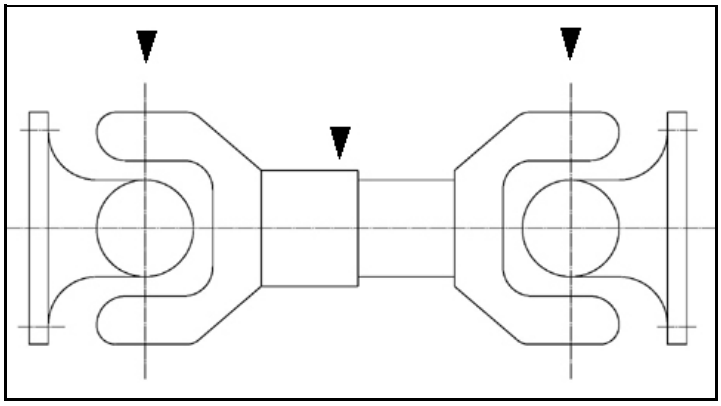
IMPORTANT!

Refer to section "Repairs - Emerging oil"

Universal joint shaft

- Grease using a grease gun until grease emerges at joints.



0000117

- Lubrication interval: 50 h

6.7 Jaw crusher

6.7.1 Lubricating the bearings

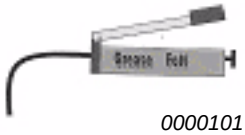
⚠ WARNING!

Risk of fatal injury caused by moving and rotating machine parts!

- **Only lubricate bearings when the plant is at a standstill and safeguarded against unauthorised restart.**

The crusher is equipped with spherical roller bearings which are designed for grease lubrication. Labyrinth seals are fitted to protect against contamination but they only function properly if sufficient grease is applied!

NOTE!



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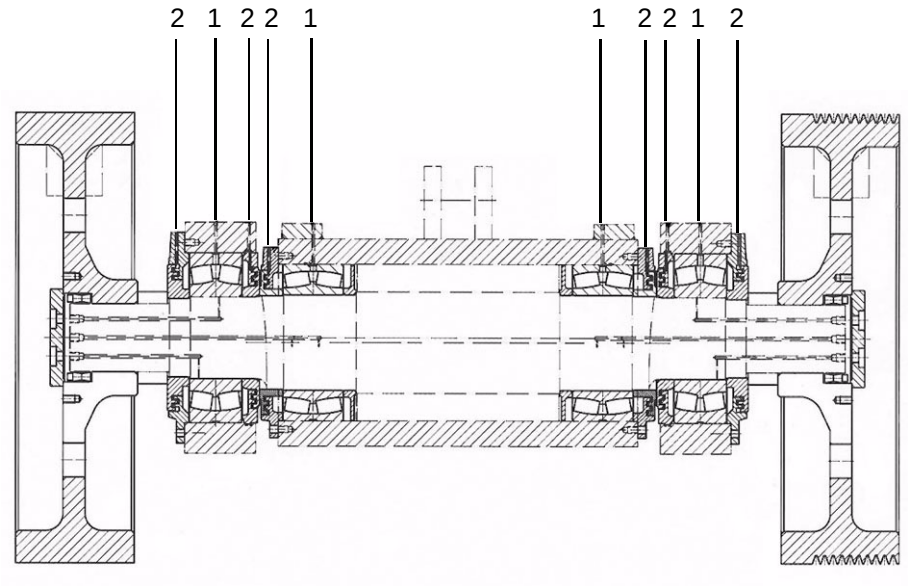
1 stroke = approx. 2 g (0.07 oz) grease



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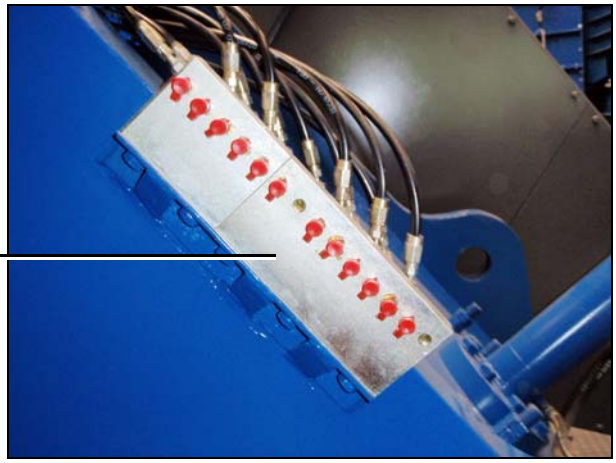
Item	Designation	Interval	Amt. of grease per lubricating area
1	Bearing	100 h	40 gramme (1.41 oz)
2	Labyrinth	50 h	Until grease emerges at the labyrinths



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NOTE!

The bearings and labyrinths of the jaw crusher are lubricated using a central scratch pad (3), which is attached on the rear side of the crusher frame.

It is possible that after lubrication bearings become very hot.
This has no negative effect on bearings.
Please note that the temperature of the bearings drops again to roughly 50 °C (122 °F) no later than 8 hours afterwards.
If after this period the abnormally high bearing temperature has not dropped, there is probably a fault in the bearing.

6.7.2 Checking the V-belts

Checks

- Check the V-belts for:
  - Cracks
  - Twisting (mainly on the large V-belt pulley)
  - Tension
- If a V-belt is twisted, return it to the correct position
- Replace worn V-belts (see chapter “Changing the V-belts”)
- If the V-belt is too loosely or too strongly tensioned, adjust the tension (see chapter “Tensioning the V-belts”)

6.7.3 Tensioning the V-belts

The V-belt tension is adjusted by adjusting the tensioning spindle. The V-belts must not vibrate when

the crusher is in no-load operation. If vibrations occur, then the belts are too loose and must be re--tensioned.

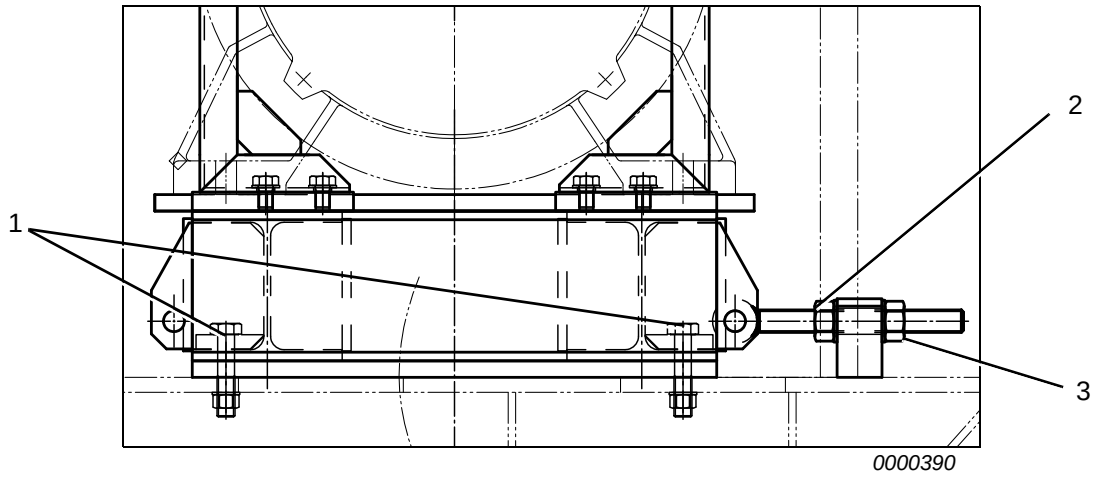
Please note

NOTE!

A newly mounted V-belt must be retensioned after 50 operating hours on account of elongation.

- Avoid excessively loose belts
  => Belts can jump out of the belt pulley
- Also avoid excessively high belt tension
  => Increased bearing load, greater belt wear

Tensioning



- Switch the system off and wait for the crusher to coast down
- Lock main switch
- Loosen mounting screws (1)
- Loosen lock nut (2)
- Turn clamping nut (3) forward or back to tension or slacken the belt
- Check the belt tension
- Tighten the lock nut (2)
- Tighten mounting screws (1)

6.7.4 Listening to bearing, checking its temperature

Unusual bearing noises or too high a temperature may indicate possible defect.

Checks must be carried out on both bearings at operating temperature of machine.

To recognise unusual bearing noises requires much experience due to high ambient noise level.

⚠ CAUTION!

Danger of burns!

Bearings can heat up intensely. Physical contact with bearings may lead to burns.

NOTE!

It is possible that after lubrication bearings may heat up intensely. This has no negative effect on bearings.
Please note that the temperature of bearings drops again to roughly 50 °C (122 °F) no later than 8 hours afterwards.
If after this period the abnormally high bearing temperature has not dropped, there is probably a fault in the bearing.

6.7.5 Checking the fixing of the crushing jaws

Check crushing jaws for correct fixing:

- Fixed crushing jaw: Check side wedges for firm position
- Loose crushing jaw: Check clamping wedge for firm position

6.7.6 Check crusher fixing

Vibrations during crusher operation can cause detachment of the crusher from the substructure.

- Regularly check the fixing elements.

6.8 Belt conveyor

6.8.1 Checking the conveyor belts

⚠ WARNING!

Risk of being pulled in!

When performing visual inspections on the running conveyor belt, there is a danger of limbs being pulled in.

- **Maintain safety distance**
- **Only perform adjustments when the belt is stationary**

- Run the belts and check for damage from a safe distance (visual inspection)

Attention must be paid to the following defects

- Edge damage
- Cover plate damage
- Fabric damage
- Detachment of endless connections
- Rubbing points
- Scoring
- Excessively strong or weak belt tensioning
  =>too weak: Belt will hang down between the carrier rollers
  =>too strong: Vibration of the bottom strand
- Slipping of the drive pulley
- Seized carrier rollers
- Worn carrier rollers
- Seized guide pulleys
- Unusual noises
- Skew running of the belt
- Trapped lumps of material
- Loose screw connections
- Contamination
- Jagged scrapers
- Worn sealing lips
- Seized scrapers (Storage)
- Off-centre conveyed material feed

- If you suspect damages or defects, stop the belt, lock the main switch and investigate the ex--

tent of the damage with the system stationary

- Eliminate any defects

6.8.2 Adjusting the scraper rubber

DANGER!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

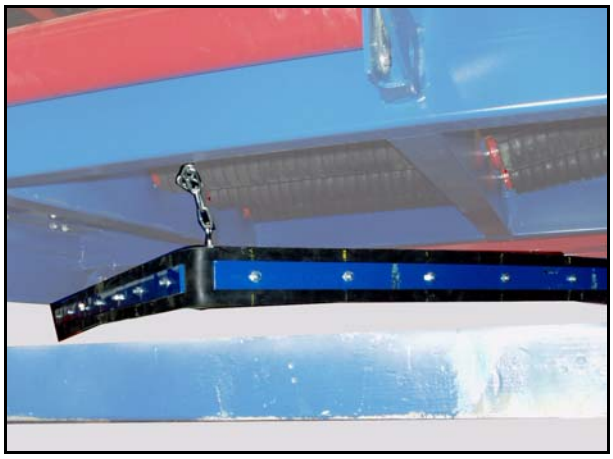
Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte--nance work.

Wedge scraper



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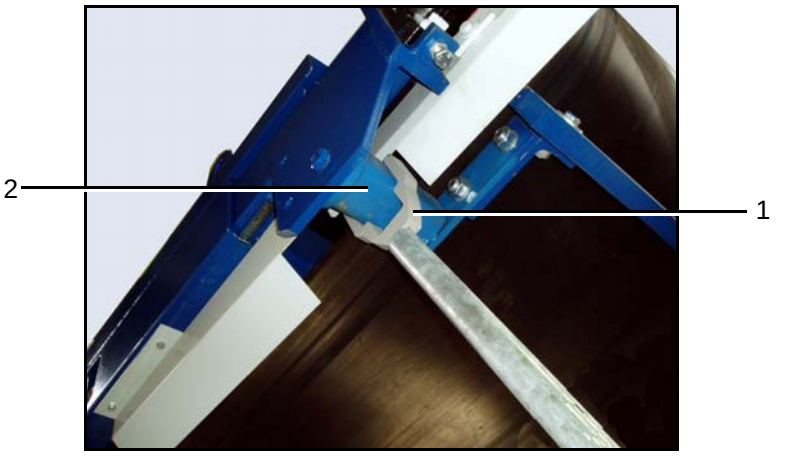
The wedge scraper is an internal belt scraper which readjusts itself automatically on account of its own dead weight.

Regularly check the scraper lip for wear.

Front scraper
with clamping elements that guarantee the pressure of the scraper lip

Adjusting the front scraper



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- Place the spanner (1) on the clamping element (2)
- Loosen mounting screw of clamping element
- Press on the scraper with the spanner by turning the clamping element
- Tighten mounting screw
- Repeat this process with the clamping element on the other side

6.8.3 Adjusting the sliding strips

DANGER!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

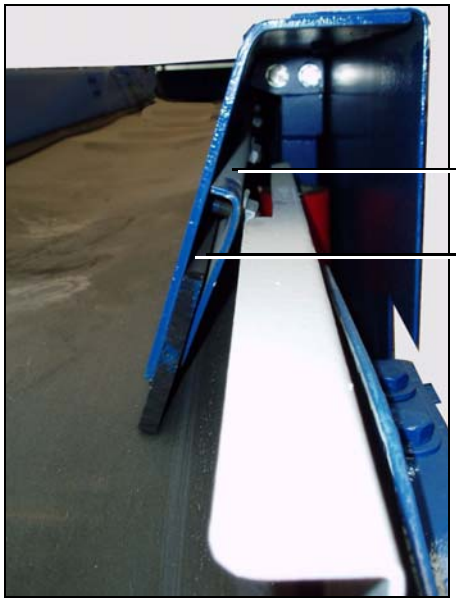
Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte--nance work.

The sliding strips seal the material guide rail to the conveyor belts. The sliding strips must be adjusted when the distance from the belt becomes too large.



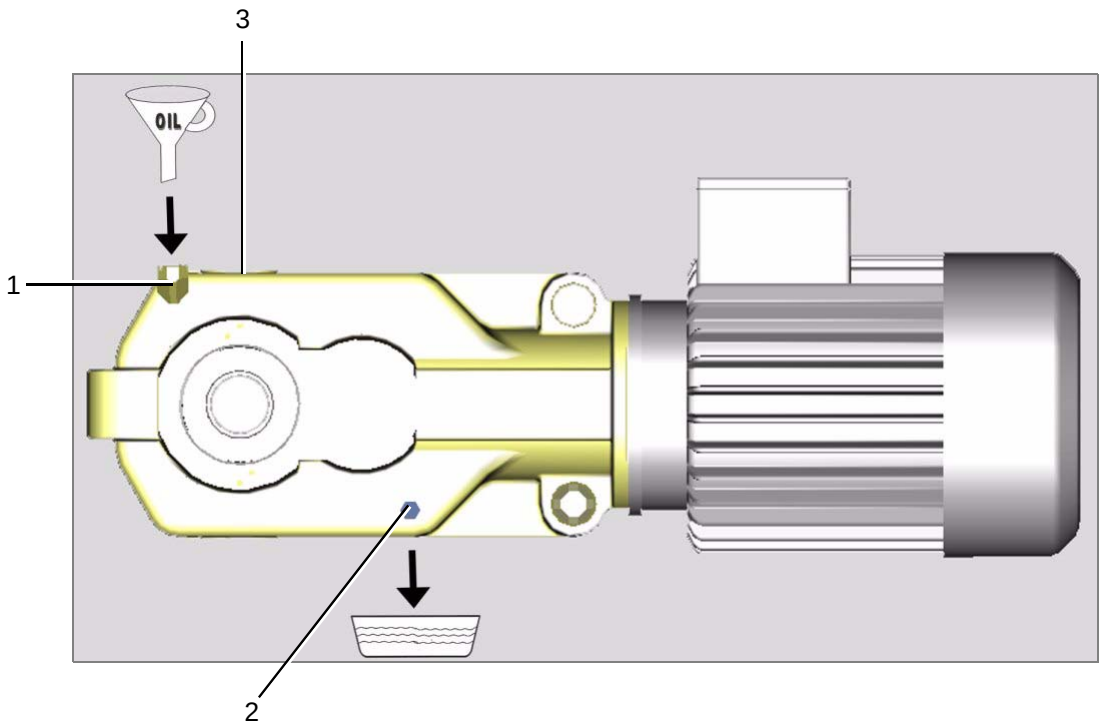
0000174

- Remove the belt (only necessary for side discharge belt conveyor)
- Unscrew the guard plates
- Loosen the clamping plates (1)
- Adjust or replace sliding strip (2)
- Tighten clamping plates
- Screw on guard plates
- Fit belt (only for side discharge belt conveyor)

IMPORTANT!

You can make the sliding strips yourself, using an old conveyor belt of appropriate thickness.

6.8.4 Belt drive oil service



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No.	Designation
1	Bleed screw
2	Drain screw
3	Motor nameplate

Oil level check

It is not normally possible to perform an oil level check, as the motors are installed at an angle and therefore the oil inspection holes are not congruent. If a large leak is detected in a gear motor, the oil quantity should be checked as follows:

- Clean the gear motor, paying particular attention to the bleed screw (1) and the oil drain-screw (2)
- Remove bleed screw
- Remove drain screw, drain oil and collect in a clean container
- Measure oil quantity. For correct oil quantity, see motor nameplate (3)
- Insert drain screw and tighten

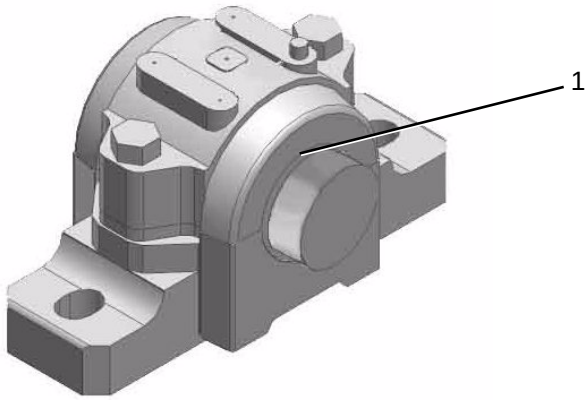
- Top up oil and replace any shortfall
- Insert bleed screw and tighten
- Check transmission for leaks

Change oil

- Clean the gear motor, paying particular attention to the bleed screw (1) and the oil drain -screw (2)
- Remove bleed screw
- Remove drain screw, drain oil and collect in a clean container
- Insert drain screw and tighten
- Add new oil, for oil quantity see motor nameplate (3)
- Insert bleed screw and tighten
- Check transmission for leaks

6.8.5 Lubricating the belt conveyor

- Ensure maximum cleanliness
- Avoid touching the conveyor belt with oil and grease
- Eliminate grease escaping from bearings and seals



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No.	Description
1	Sealing lip

- Pillow block bearings are maintenance-free (grease change 2000 h; 2 years)
- Check sealing lips of pillow block bearings weekly

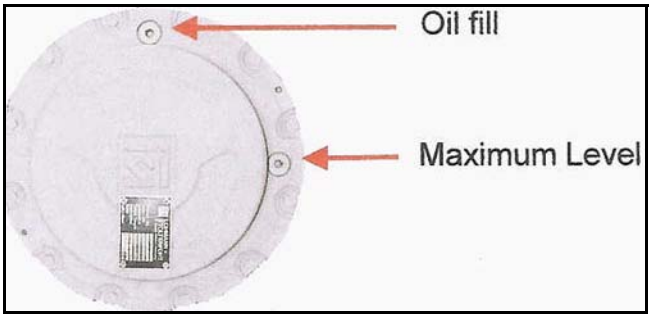
NOTE!

Replace defective sealing lips immediately. Otherwise there is a risk of bearing damage.

6.9 Crawler-track chassis

6.9.1 Planetary gear oil service

- Position the machine so that the filling hole is at the top and the outlet is at the side (inspection plug)
  Inscription is stamped into the housing



0000123

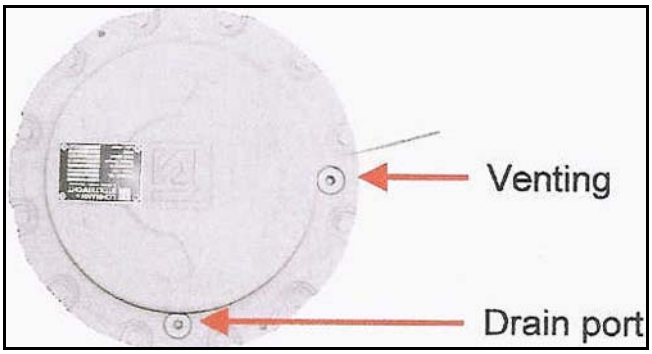
Oil level check

- Remove inspection plug

  - If no oil emerges,

  - use an Allen wrench to check how far below the inspection hole the oil level is (do not let the Allen wrench fall in).
- Top up oil if required

Oil change



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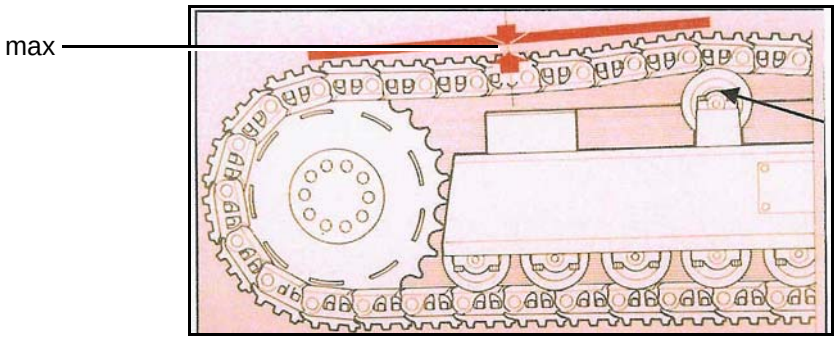
- Remove inspection and drain plugs
- Collect oil in suitable receptacle
- Fit drain plug
- Pour oil into the filling hole up to the height of the inspection plug
- Fit inspection plug

6.9.2 Chain tension

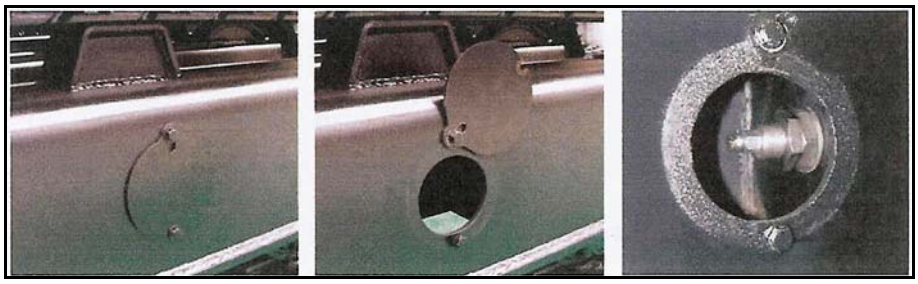
Inspection



0000125

- Extend the chain on level ground
  Chain should be load-free if possible
- Check whether the upper section of the chain is clearly sagging
- If the chain is sagging more than 3 - 4 cm (1.2 in - 1.6 in) at the lowest point, it must be re-tensioned

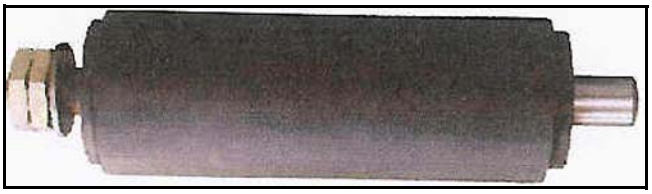
Tensioning the chain



0000126

- Check chain for damage
- Unscrew chain tensioner cover
- Push on sliding coupling
- Tension chain by forcing in grease with a grease gun
  Check changes in chain tension during tensioning
  Ideally use an electric grease gun
- Remove sliding coupling
- Screw on chain tensioner cover

6.9.3 Chain tensioner



0000127

⚠ WARNING!

Risk of injury!

There is a very high risk of accident when carrying out repairs to the chain tensioner. Repairs must be carried out in a specialist workshop. Do not under any circumstances attempt to open the inner cylinder.

6.9.4 Check transmission for leaks

The planetary gear and the hydraulic chain drives must be checked for leaks daily. If escaping oil is detected, the damage must be eliminated immediately.

6.9.5 Checking the fixing of the track rollers and baseplates

- Tap the screws to check the fixing of the track rollers
- If the screws move, tighten them immediately.
- Replace defective screws immediately

6.10 Electro-hydraulic drive system

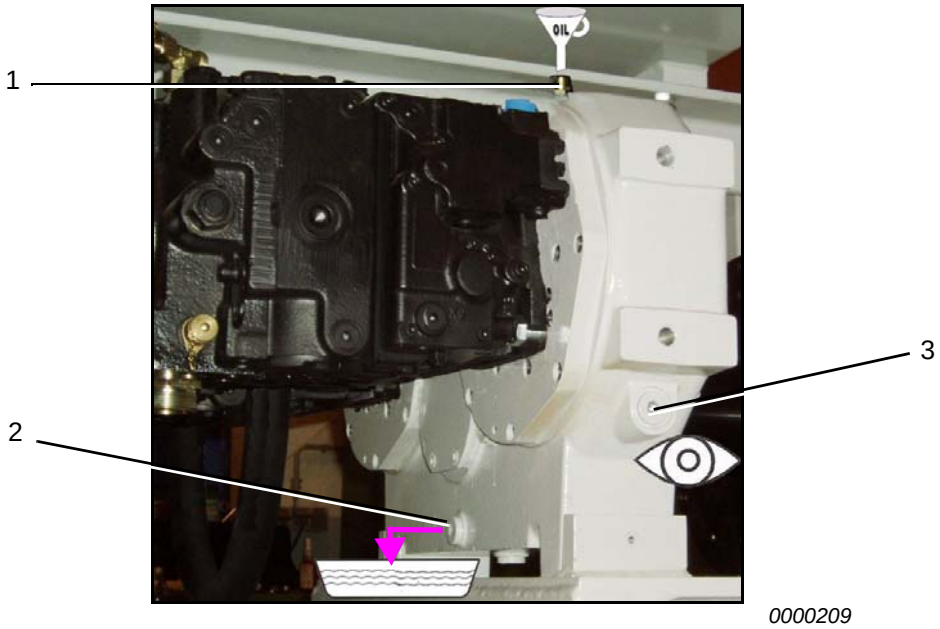
6.10.1 Pump distribution gear oil service

- Check all seals and screw connections for leaks during each oil change. Tighten screws if necessary.

Premature gear failure can occur

- as a result of dry running due to oil losses,
- as a result of water penetrating the gear housing or
- as a result of foreign objects in the lubricant filling.

- After the test run (commissioning), loosen the overflow screw and check the oil level
- Check that the vent filter is screwed in
- Check the seals of the hydraulic pumps with a high oil level



No.	Designation
1	Vent filter
2	Drain screw
3	Checking screw

Oil change

- Unscrew the vent filter (1)
- Place collecting vessel beneath the drain screw (2)
- Drain oil
- Screw in drain screw and tighten
- Add new oil
- Screw in vent filter
- Check for leaks

Check oil level

- Unscrew checking screw (3).
- Oil must be at the level of the checking screw.
- Check the seals of the hydraulic pumps with a high oil level.
- Top up oil if necessary
- Screw in checking screw and tighten
- Check for leaks

6.10.2 Traction clutch

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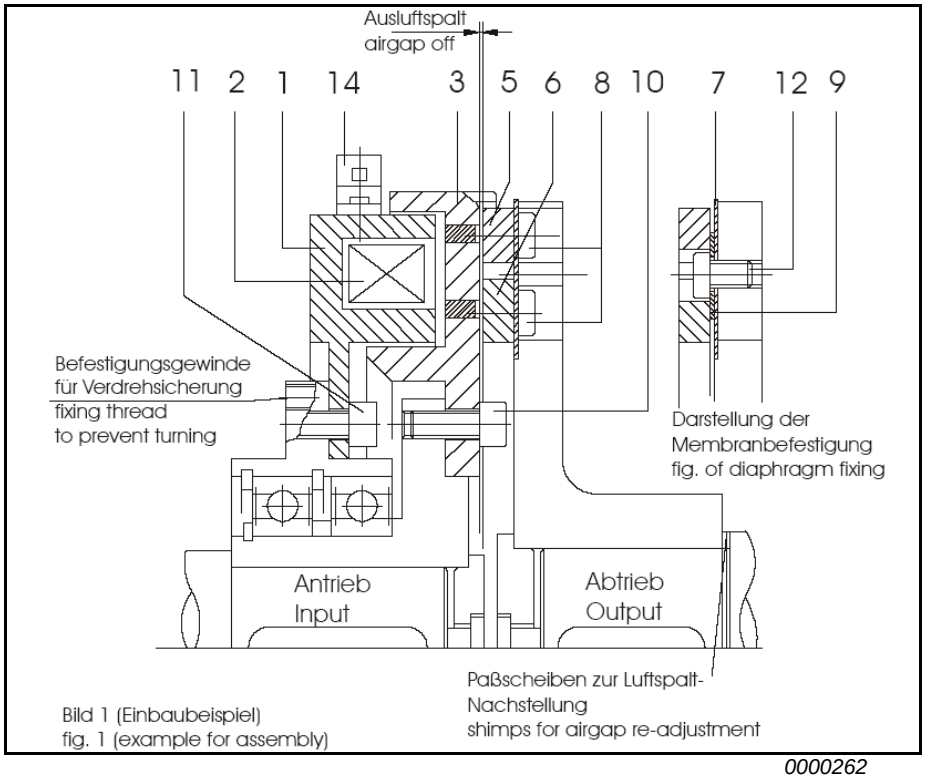
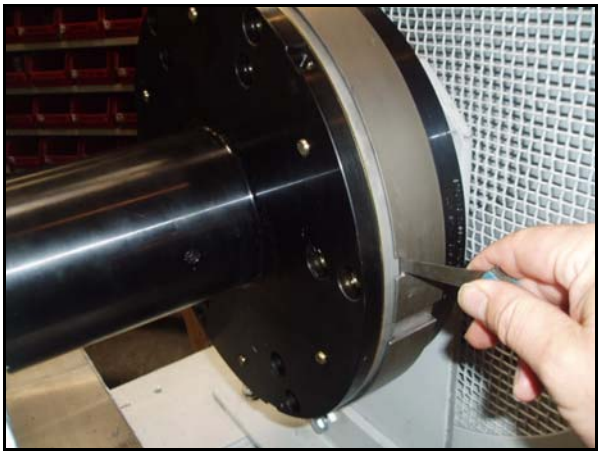


Bild 1 (Einbaubeispiel)
fig. 1 (example for assembly)

0000262

No.	Name
1	Brake coil body
2	Coil
3	Rotor
5	Armature disk outside
6	Armature disk inside
7	Diaphragm
14	Connecting terminal 2 pole

Check outside air gap



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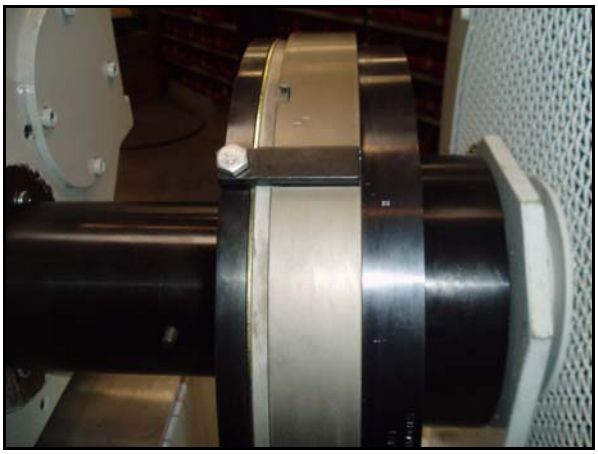
- Check outside air gap at the perimeter with feeler gage twice. Second inspection position dis-- placed by 180° to the first one.
- Insert feeler gage through two slots in the rotor radially outside
  Nominal size = 0.5 mm (0.02 in)

Emergency locking in case of failure of the coupling



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- Place three feather keys into the slots and fix with screws

IMPORTANT!

After the processing the system, remove the feather keys immediately. Otherwise it can lead to an overheating of the hydraulics.

6.11 Hydraulic system

Safety information

DANGER!

Danger of serious physical injury!

Hydraulic fluid is under high pressure. When working on the hydraulic system, squirting hydraulic oil can result in very serious eye injuries or other injuries.

Work on the hydraulic system must be carried out with the system de--pressurised.

In the event of injuries consult a doctor immediately, due to the risk of infection.

1. Hydraulic system is under high pressure!
2. Use suitable aids for detecting leaks, due to risk of injury!
3. Before carrying out work on the hydraulic system, the system must be depressurised.
4. The motor must be switched off prior to carrying out work on the hydraulic system

NOTE!

Ensure safe and environmentally sound disposal of lubricants and filters!

6.11.1 Hydraulic filter

The hydraulic system is equipped with two suction filters, a return filter and a tank air filter.

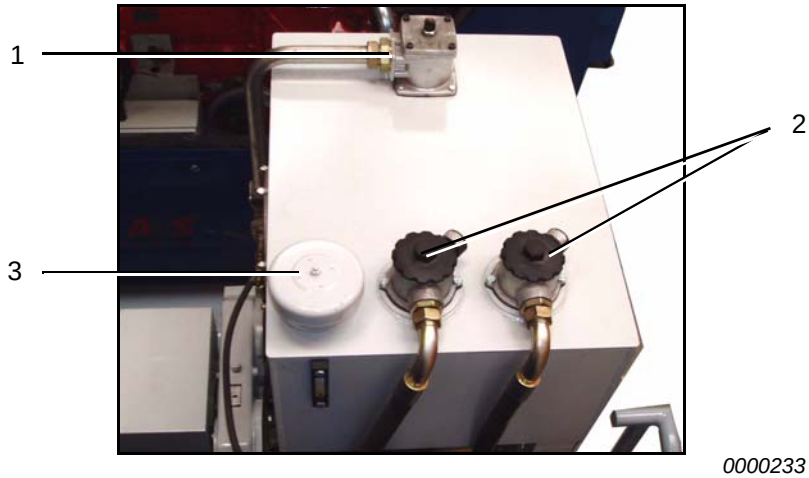
Replacement interval: for the first time 500 hrs
then 1000 hrs

Please note:

- Use the same kind of filter only

Replacing the filter:

- Shut off the machine.
- Remove the cover of the filter housings
- Replace the filter cartridge
- Mount the covers of the filter housing back
- Switch on the hydraulics
- Check filters for leakproofness



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No.	Name
1	Return filter
2	Suction filter
3	Tank air filter

6.11.2 Hydraulic hose lines

Check hydraulic hose lines regularly and in case of damage and aging, replace the old one! The new lines must correspond to the technical requirements of the equipment manufacturer!

Recommended replacing intervals

- Normal requirements: at least every 6 years
- increased requirements (increased application periods, e.g. multi-shift operation, strong ex-- ternal influences): at least every 2 years

Recommended inspection intervals

- Normal requirements: 12 Months
- increased requirements (increased application periods, e.g. multi-shift operation, strong ex-- ternal influences): 6 Months

6.12 Electrical switch cabinet

We recommend that you carry out an occasional check to see that the terminal and connecting bolts in the switch cabinet are firmly located and tighten them if necessary.

The system must also be protected from dust. If there are large dust deposits in the cabinet, these should be removed by aspiration. The seals on the switch cabinet doors must be regularly checked and replaced annually.

DANGER!

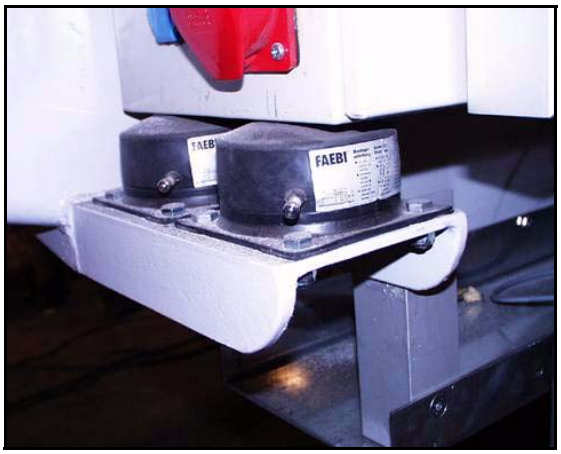
Risk of fatal injury due to electric shock

In the event of contact with live parts, there is a risk of serious injuries due to electric shock!

Before carrying out work on electrical systems,

- **disconnect them from the power supply**
- **protect them against re-starting**
- **ensure that they are disconnected from the power supply**
- **affix maintenance sign**

Switch cabinet mounting



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- Regularly check the rubber air-springs for damage and pressure.

M no.	Type	Pressure	Diameter	Height	Use
M10015053	FAEBI 100	5 bar (72.5 psi)	118 mm (4.6 in)	72 mm (2.8 in)	Double switch cabinet
M10015474	FAEBI 50	3.5 bar (50.7 psi)	80 mm (3.1 in)	60 mm (2.3 in)	Single switch cabinet

NOTE!

Check height of rubber air springs every three months and add more air if required.

7 Repairs

7.1 Safety information

- Risk of fatal injury!
  Only carry out repair work or maintenance work when machine is turned off!
  Safeguard against unauthorised start-up of machine:
  - Lock switch cabinet
  - Switch off and lock main switch
  - Attach warning sign against restart.
- Those responsible must ensure that during maintenance work the machine is inoperative and they must safeguard it against its unauthorised restart.
- Retrofitting, welding and repair work to the machine may only be carried out by those commissioned by the manufacturer. When welding, the earth terminal must be located as close as possible to the weld. Otherwise this may lead to destruction of protective earthing system or bearings.
- If electrical or hydraulic components are replaced, then they must be adjusted in accordance with the details on type plate or wiring diagram.
- Conveyor belts and hopper walls must be supported as soon as work starts on valves, cylinders or hydraulic pipes.
- Throttle valves and pressure relief valves set by Kleemann may only be changed by personnel trained by Kleemann. It is forbidden to remove seals from safety valves.

DANGER!

Failure to follow the above-mentioned safety instructions may lead to severe injuries and also material damage which is not covered under warranty.

7.2 Repair work

The following repair work may be carried out by trained and qualified staff themselves. In the case of doubt, however, the manufacturer must be asked for more precise information.

7.3 Vibrating conveyor chutes

7.3.1 Replacing the vibration motor

If there is a defect in the vibration motors, it may be necessary to replace one or both motors. Only the same make and type of motor may be used.

⚠ WARNING!

Risk of injury!

During test runs, there is a high risk of crushing and pulling in due to ro-- tating or vibrating motor parts. Limbs can be sheared off or torn out.

Always maintain a safe distance from the machine.

NOTE!

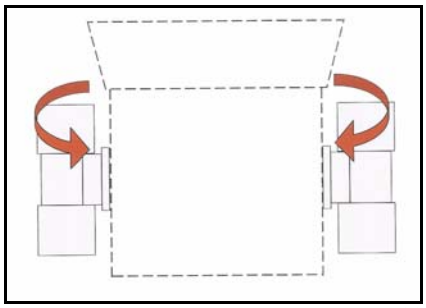
The unbalance setting must be the same on both motors!

NOTE!

After 10 h full operation, retighten the mounting screws of the vibration motor with the necessary torque.

Rotational directions of vibration motors

Motors have different installation situations. The following illustrations show the prescribed rotational directions.



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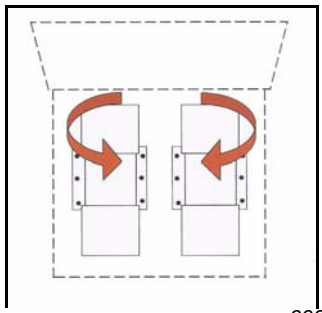

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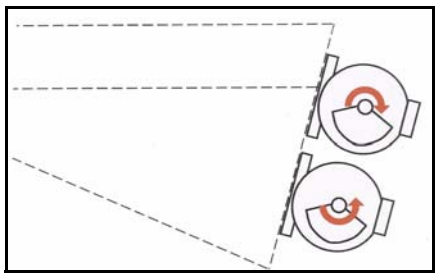

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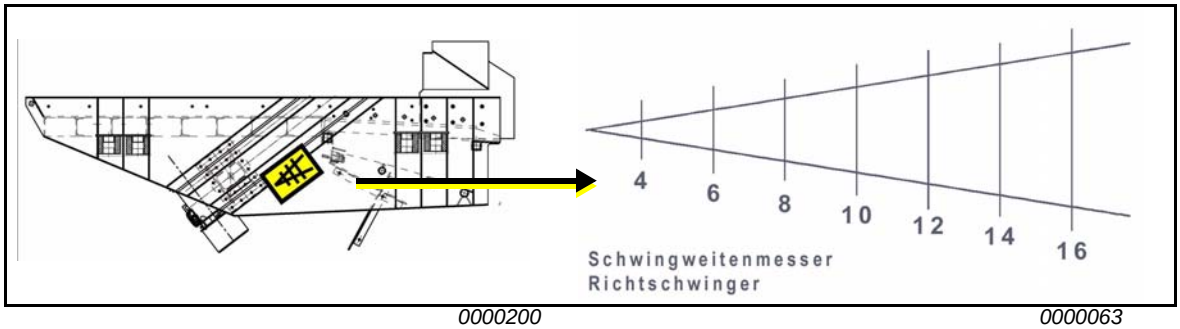
7.3.2 Measuring the stroke (Chute)

⚠ CAUTION!

Risk of fatal injury and damage to property!

Incorrectly set unbalances can result in damage to the machine!

- **All unbalances must have an identical setting**
- **All modifications and adjustments to the unbalances require prior con-- sultation with the manufacturer.**



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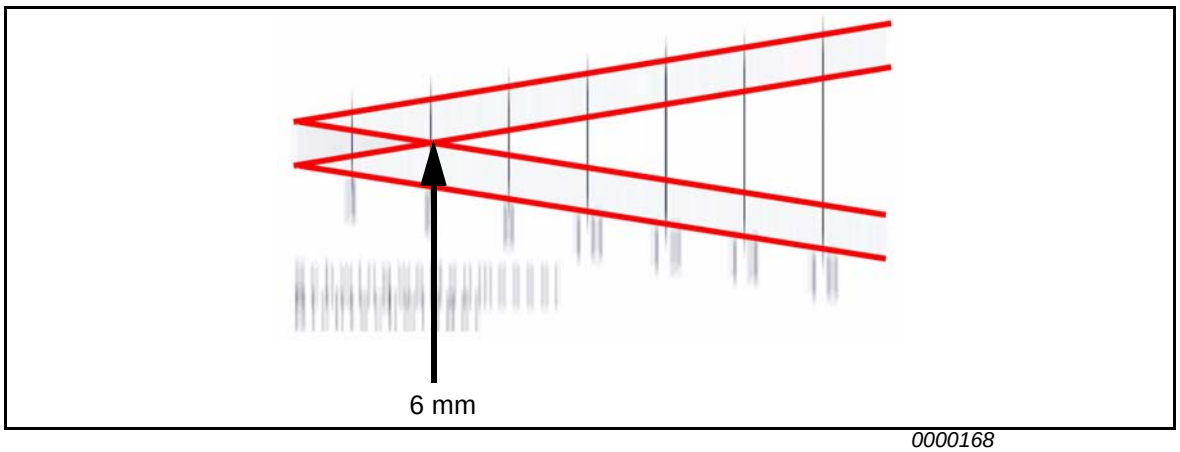
The stroke must be read off on the plate on the chute with the chute running.

- Switch chute on
- Read off stroke on the stroke meter



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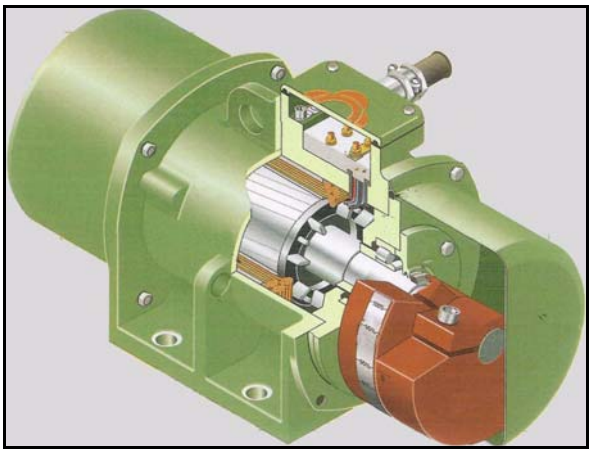
Stroke results from the point of intersection of both straight lines The read-off value corresponds to the stroke in mm

7.3.3 Adjusting the stroke



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⚠ WARNING!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte-- nance work.

⚠ CAUTION!

Risk of fatal injury and damage to property!

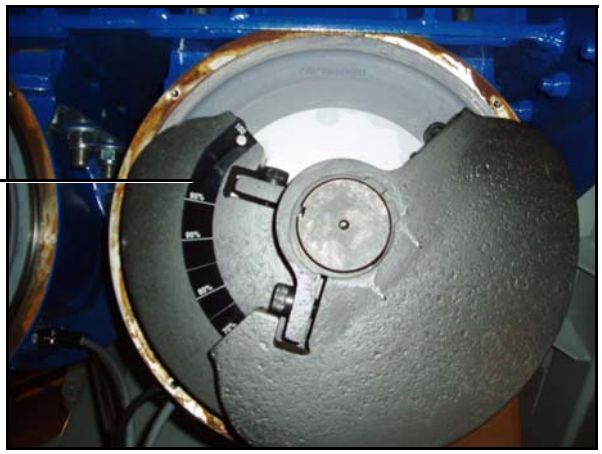
Incorrectly set unbalances can result in damage to the machine!

- **All unbalances must have an identical setting**
- **All modifications and adjustments to the unbalances require prior con-- sultation with the manufacturer.**

Please note:

Both motors must have the same unbalance setting!

- Remove protective covers from the unbalance vibrator



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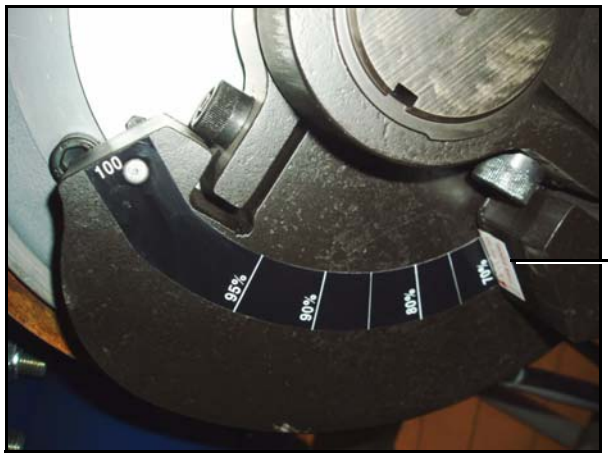
- Loosen clamping bolt (1) on **internal** unbalance disk



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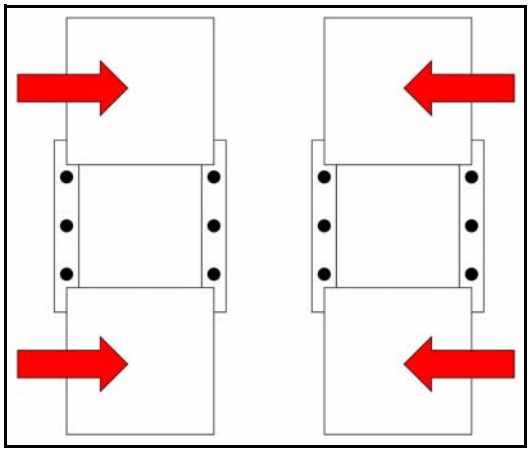
- Set the desired percentage using the power scale (2)
- Tighten clamping bolt on internal unbalance disk



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- Set the opposite side to the same percentage

Clamping bolt tightening torque						
Screw	**M 6**	**M 8**	**M 10**	**M 12**	**M 16**	**M 24**
Tightening torque [Nm] (lb ft)	**11 Nm (8 lb ft)**	**27 Nm (20 lb ft)**	**55 Nm (41 lb ft)**	**100 Nm (75 lb ft)**	**176 Nm (130 lb ft)**	**490 Nm (365 lb ft)**

Maximum unbalance setting in % with higher speed as rated speed	
%	**Hz**
100 %	**50 Hz**
90 %	**53 Hz**
80 %	**56 Hz**
70 %	**60 Hz**
60 %	**65 Hz**
50 %	**71 Hz**

7.4 Vibrating screen

7.4.1 Emerging oil

Oil emerging from labyrinth seals can be caused by a number of things.

- Machine is not horizontal.
  Remedy: Align machine horizontally.
- Labyrinths not lubricated.

Remedy: Lubricate labyrinths.

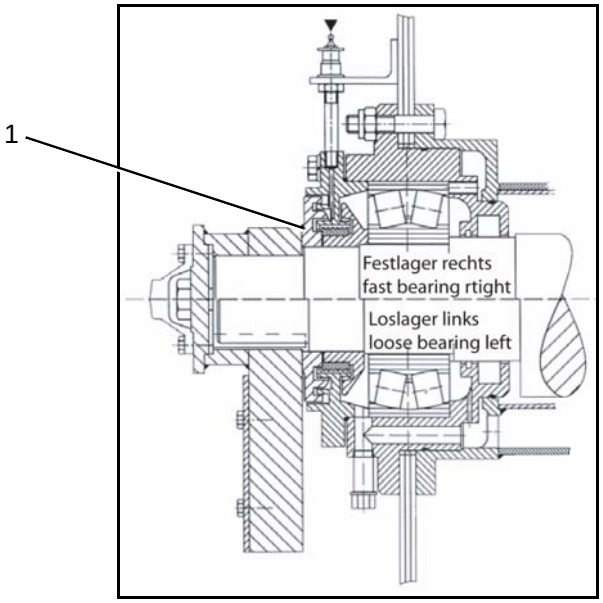
- Labyrinths over-lubricated.
  Remedy:
  - Do not lubricate labyrinths over a long period (100 h).

IMPORTANT!

During this period carry out daily oil level checks.

- Clean return bushing (1).

Reason:



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The built-in return bushings normally carry the lubricating oil away from the labyrinths to the bearings.

Due to over-lubrication the thread of the return bushing becomes clogged and no longer operates ef--ficiently.

7.4.2 Checking vibration amplitude (screener)

⚠ WARNING!

Risk of fatal injury!

If screener is in operation for reading vibration amplitude when unbal-an-ce protection has been removed, there is a high accident risk caused by getting caught between moving parts or objects coiling around parts.

Only check screener with built-in unbalance protection.

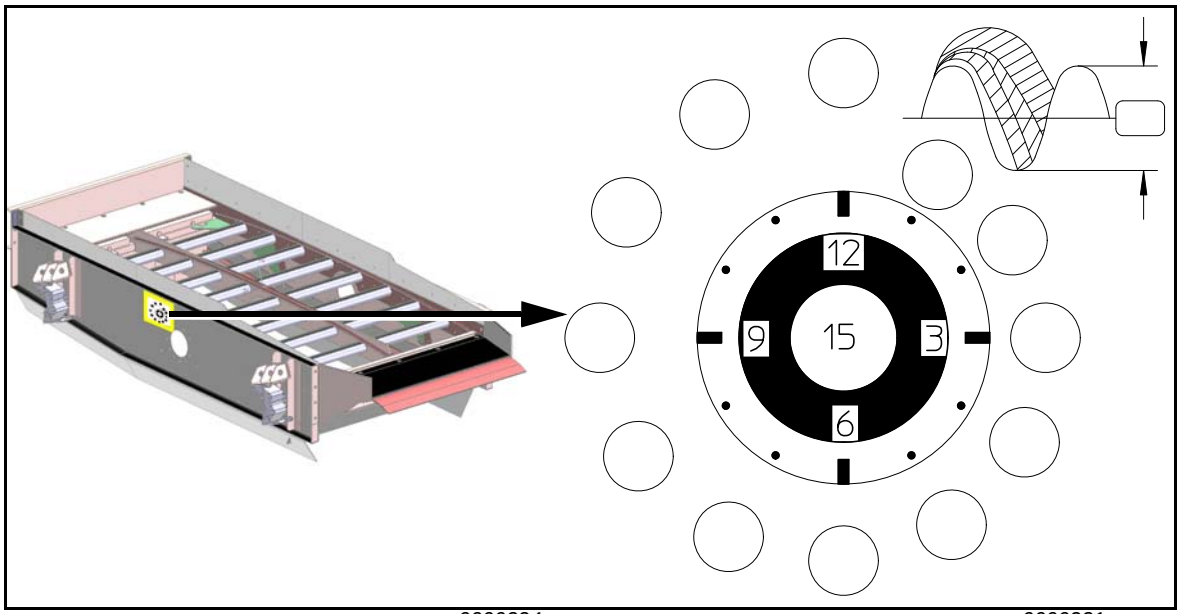
⚠ CAUTION!

Risk of fatal injury and/or material damage!

Incorrectly adjusted unbalances may lead to destruction of machine!

- **All unbalances must be precisely adjusted.**
- **Changes and adjustments to unbalances may only take place after consulting manufacturer.**

Vibration amplitude must be read while screener is operating.



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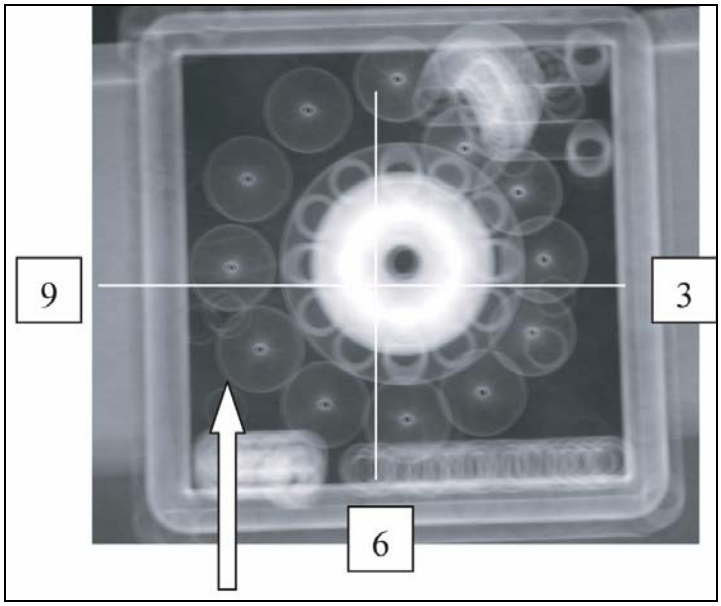
Note:

- Vibration amplitude can be read similar to a clock. One of the 12 small circles makes visual contact with the inner circle. The point of contact gives the vibration amplitude in mm.
- If vibration amplitude is exceeded, it must be reduced.
- Vibration amplitude meter must be fixed in centre of screener above unbalance.



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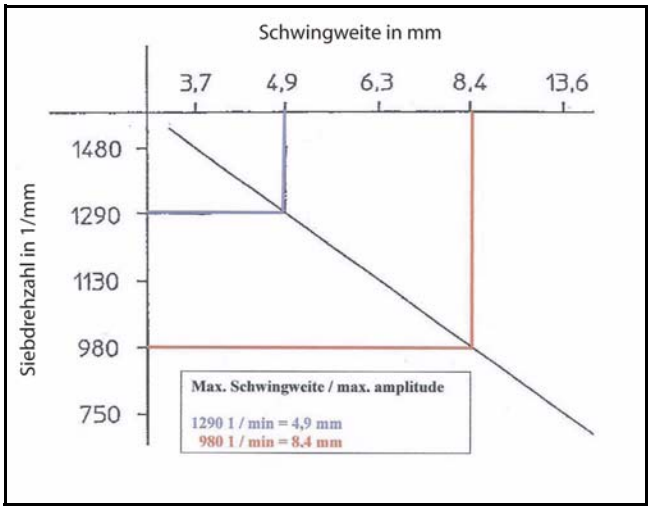
Example: 8 mm vibration amplitude (arrow)

The maximum permissible vibration amplitude depends on the speed of the screener motor. In the following diagram, the maximum permissible vibration amplitudes can be read.

It is not permissible to exceed the values.



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7.4.3 Adjusting vibration amplitude (screener)

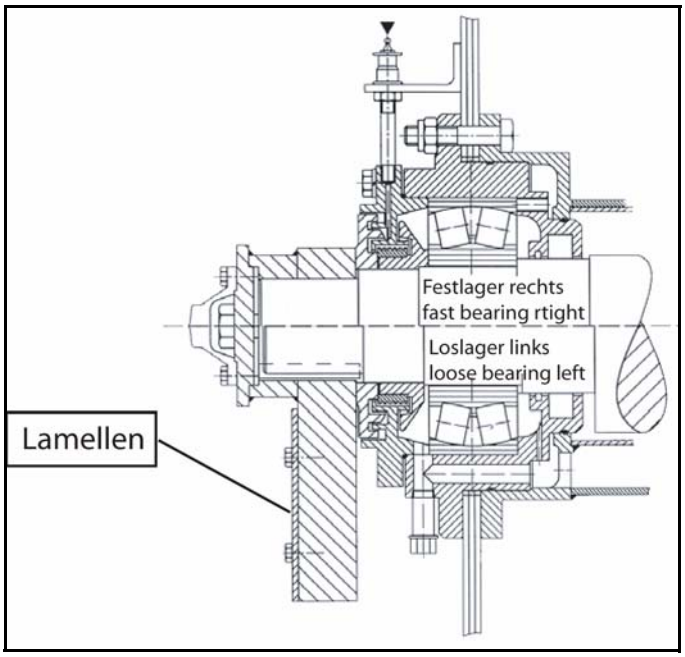
⚠ CAUTION!

Risk of fatal injury and/or material damage!

Incorrectly adjusted unbalances may lead to destruction of machine!

- **All unbalances must be precisely adjusted.**
- **Changes and adjustments to unbalances may only take place after consulting manufacturer.**

Vibration amplitude may be changed with aid of lamellas which are screwed onto external unbalance components.



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Adjusting vibration amplitude:

- **Attach additional lamellas** → **Increase vibration amplitude**
- **Remove lamellas** → **Reduce vibration amplitude**

NOTE!

The number and size of the lamellas must be the same on both unbal-an-ce components. Or else screener vibrates diagonally.

7.4.4 Replacing the screen cover

NOTE!

Whenever a new screen cover has been installed, it should be re-ten-sio-ned approximately 1 day after it was first tensioned.

Lower screen cover (wire fabric)

Removal

- Switch off machine and turn off main switch
- Remove deflection chute (if fitted) to create more space
- Undo and remove tightening screws
- Lower setting bracket and take out from the bottom
- Push screen cover forwards and detach from front section
- Pull screen cover out to the rear
- Check profile rubbers, re-align or replace if necessary

Installation

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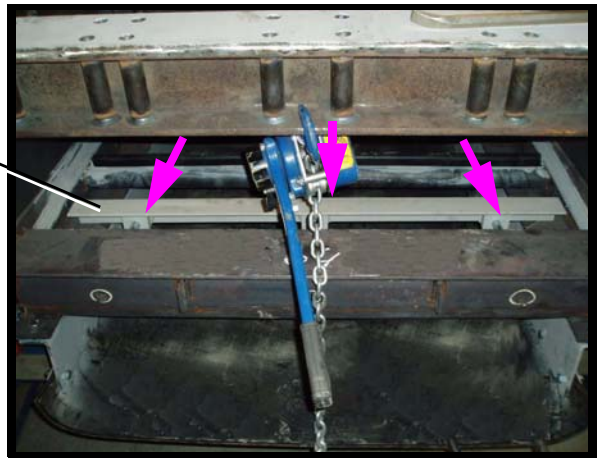
- Insert new coating
- Attach cover in the rear section



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- Insert setting bracket (1) and push through tightening screws from the rear
- Tighten tightening screws a little
- Tension screen cover (see section “Tensioning the screen cover”)
- If removed earlier, refit deflection chute
- Whenever a new screen cover has been installed, re-tension it again approx. one day later

Upper screen cover (bar screen)

Removal

- Switch off machine and lock main switch
- Unscrew deflection chute
- Remove lower screen cover
- Unscrew upper screen cover fastening screws (some screws are screwed in all the way th-rough, some from above)
- Attach screen cover onto shovel loader or crane
- Lift screen cover clear

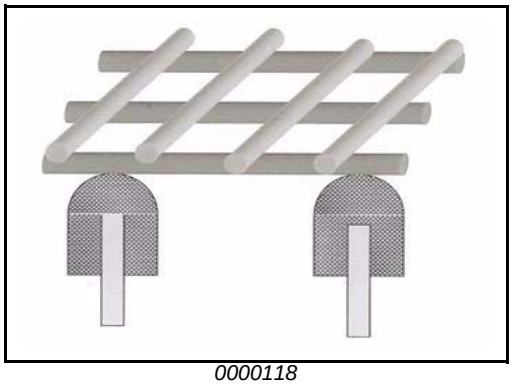
Installation

- Clean contact surface
- Insert new cover
- Insert fastening screw and torque to 420 Nm (310 lb ft);
  use new screws if possible; always use new safety nuts on screws inserted all the way through
- Insert and tension lower screen cover
- Fit deflection chute

7.4.5 Rubber profiles

Damaged or displaced rubber profiles on iron support frame must be replaced immediately in order to avoid damage to screen liners.

Correct!



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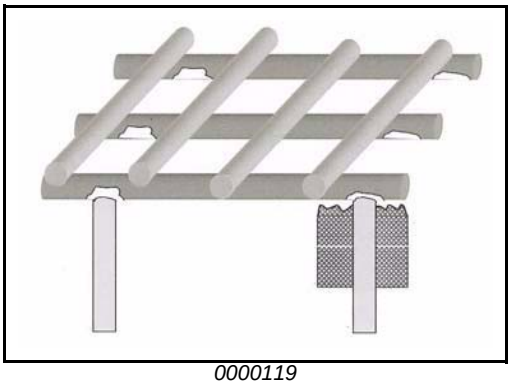
Incorrect!



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7.4.6 Springs

Inspect springs for wear and tear, increasing fatigue, brittleness and cracks.

7.4.7 Sealing elements

Sealing elements must be checked regularly for function, cleanliness, tightness, damage, as well as cracks and brittleness, and must be changed if necessary.

7.4.8 Wear lining

Regular inspections for fastening, abrasion and cleanliness.
Wear lining must be inspected weekly and replaced if worn.

7.4.9 Screen box

⚠ CAUTION!

Material damage!

Machines whose vibration is obstructed cause cracks and destroy the bearing!

- **Observe minimum distance between firmly anchored and freely vibra-t-ing components.**
- **Clean machine regularly.**

- Regularly check screen box for unobstructed movement, smoothness of running and security.

7.5 Jaw crusher

⚠ WARNING!

Risk of fatal injury!

Only perform repairs or maintenance work with the machine switched off!

Protect against unauthorised starting:

- **Lock the switch cabinet**
- **Switch off and lock the main switch**
- **Affix warning sign to guard against re-starting**

NOTE!

The person responsible must ensure that the system is stationary and has been protected against unauthorised starting during the mainte-- nance work.

⚠ WARNING!

Risk of fatal injury or serious damage to property due to falling parts.

Raised or suspended loads can result in serious injuries or considerable damage to property!

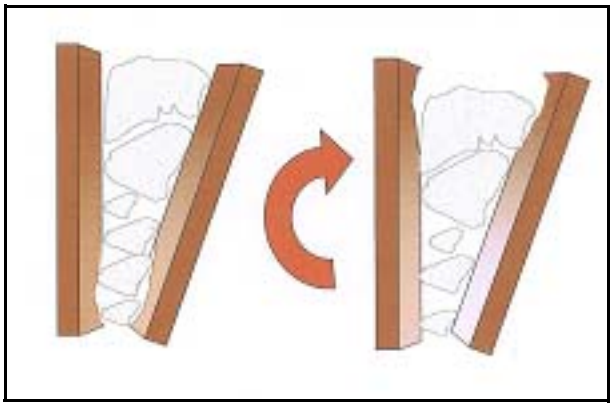
- **Never walk underneath suspended loads**
- **Maintain an adequate safety distance**
- **Transport parts as close to the ground as possible**
- **Do not grasp underneath the parts when lowering them**
- **Always check that the hoisting unit is in proper condition and has ad-e-quate carrying capacity**
- **Suspend the parts at their centre of gravity**
- **Ensure slip-resistant fastening of chains and ropes to the components**

7.5.1 Crushing jaws

The bottom section of the jaw crusher is subject to heavier wear than the top. The crushing jaws are

symmetrical and can therefore be turned.

Example:



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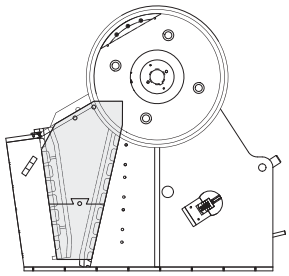
7.5.2 Changing the lateral wedges

Detachable version



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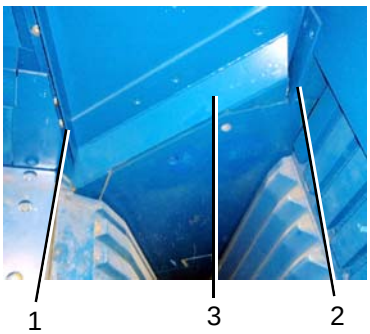
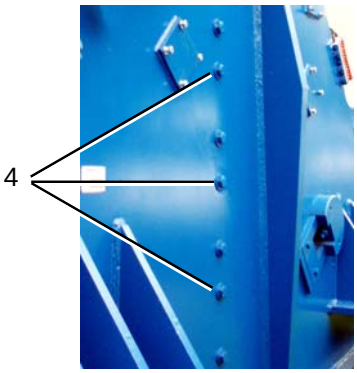
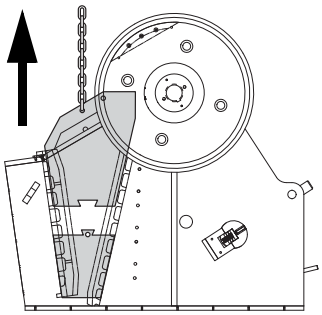
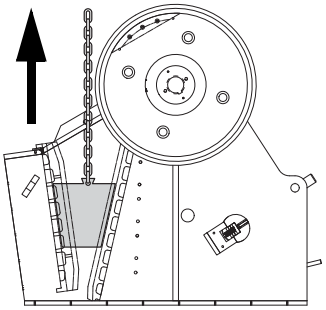
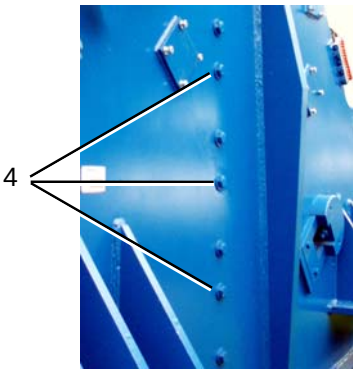
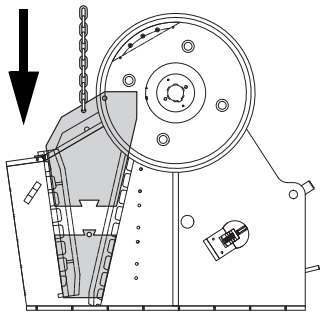
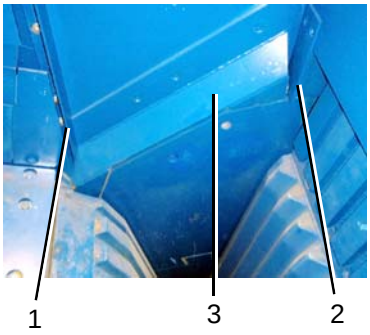
1	 *0000925*	• Remove the end plate for the primary screen (1) • Remove the end plate for the articulated crusher jaw (2) • Remove the cover plate (3) • Carry out the instructions listed on the opposite side

2	 *0000926*	• Loosen all 8 screws (4) on the terminal strips but do not remove them. The lateral wedges are thus loosened. • Carry out the instructions listed on the opposite side
3	 *0000927*	• Completely loosen the lateral wedges using a hammer • Remove worn upper lateral wedge using appropriate hoisting gear The upper and lower lateral wedges are no longer connected to each other. The dovetail serves to loosen the lower lateral wedge.
4	 *0000928*	• If necessary, loosen the lower lateral wedge using the appropriate tool • Remove worn lower lateral wedge using appropriate hoisting gear • Carry out the instructions listed on the opposite side

5	 *0000926*	• Clean the contact surfaces of the terminal strips and lateral wedges • Rescrew all 8 screws (4) onto the contact strips using the correct tightening torque • Carry out the instructions listed on the opposite side
6	 *00000927*	• Insert a new lower lateral wedge and hammer into the guides • Insert a new upper lateral wedge and again hammer into the guides • Carry out the instructions listed on the opposite side
7	 *0000925*	• Reattach the cover plate (3) • Reattach the end plate for the articulated crusher jaw (2) • Remove the end plate for the primary screen (1) • Carry out the instructions listed on the opposite side

NOTE!

Check the security of the lateral wedge after 10 hours of full operation.

7.5.3 Changing fixed crushing jaw

⚠ WARNING!

Risk of fatal injury or serious damage to property due to falling parts.

Raised or suspended loads can result in serious injuries or considerable damage to property!

- **Never walk underneath suspended loads**
- **Maintain an adequate safety distance**
- **Transport parts as close to the ground as possible**
- **Do not grasp underneath the parts when lowering them**
- **Always check that the hoisting unit is in proper condition and has ad-e-quate carrying capacity**
- **Suspend the parts at their centre of gravity**
- **Ensure slip-resistant fastening of chains and ropes to the components**

⚠ WARNING!

Risk of fatal injury!

When raising the rocker there is a risk of the crushing jaw tipping, resul-t-ing in crushing injuries.

- **Raise the crushing jaw carefully**
- **Maintain safety distance**

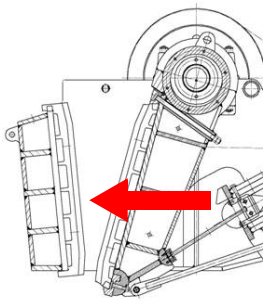
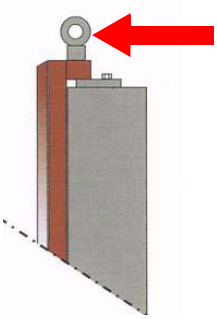
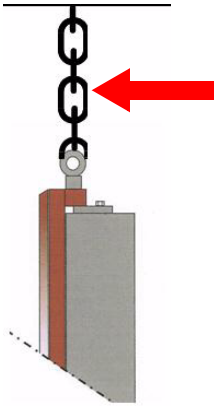
NOTE!

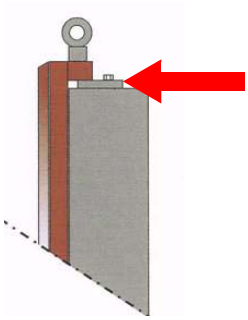
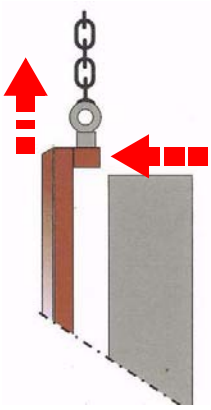
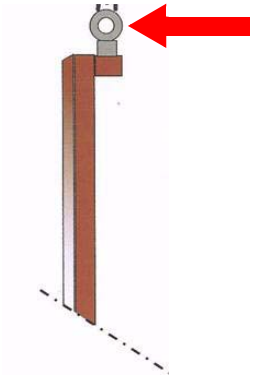
Note weight of crushing jaw!

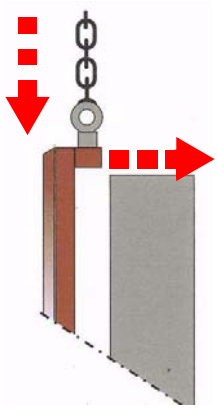
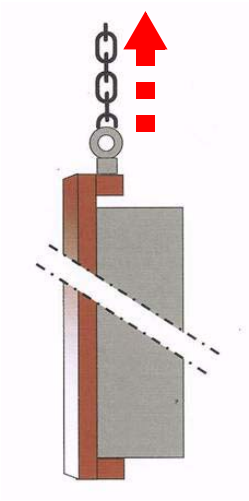
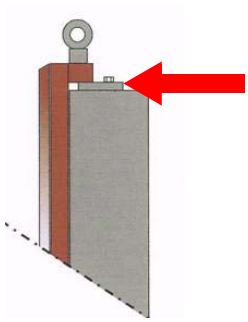
IMPORTANT!

Set gap width to maximum.

Removal

	 *0000187*	
1	**See chapter “Changing the side wedges”**	**Remove the side wedges**
2	 *0000188*	**Affix the mounting lug**
3	 *0000189*	**Attach crusher jaws to appropriate hoisting unit** **Note weight of crushing jaws!**

4	 *0000188*	**Remove distance plate**
5	 *0000190*	**Remove the crushing jaw from the frame with the hoisting unit**
6	**Turn the crushing jaw or prepare new crushing jaw**	
7	**Clean the bearing surface**	
8	 *0000190*	**Affix the mounting lug**

9	 *0000190*	**Drive crushing jaw into the frame with the hoisting unit**
10	 *0000192*	**Hoist the crushing jaw completely so that it is posi--tioned gap-free on the lower frame mounting** **Ensure that the crushing jaw is centrally positioned**
11	 *0000188*	**Equalise gap between crushing jaw and frame mounting with distance plate**
12	**See chapter “Changing the side wedges”**	**Fit the side wedges**

7.5.4 Changing loose crushing jaw

⚠ WARNING!

Risk of fatal injury or serious damage to property due to falling parts.

Raised or suspended loads can result in serious injuries or considerable damage to property!

- **Never walk underneath suspended loads**
- **Maintain an adequate safety distance**
- **Transport parts as close to the ground as possible**
- **Do not grasp underneath the parts when lowering them**
- **Always check that the hoisting unit is in proper condition and has ad-e-quate carrying capacity**
- **Suspend the parts at their centre of gravity**
- **Ensure slip-resistant fastening of chains and ropes to the components**

⚠ WARNING!

Risk of fatal injury!

When raising the rocker there is a risk of the crushing jaw tipping, resul-t-ing in crushing injuries.

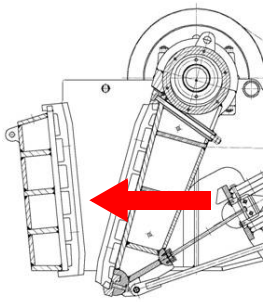
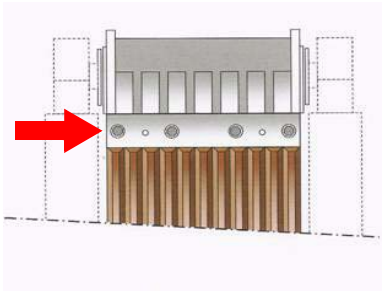
- **Raise the crushing jaw carefully**
- **Maintain safety distance**

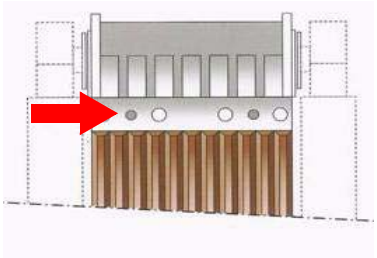
IMPORTANT!

Set gap width to maximum.

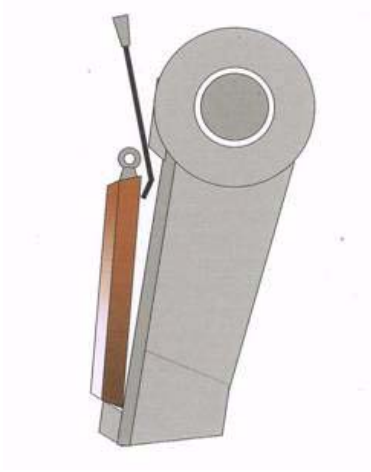
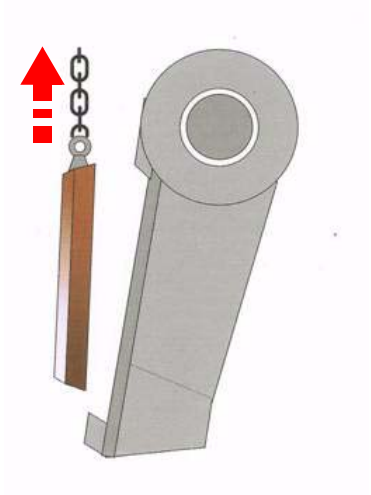
Dismount all distance plates

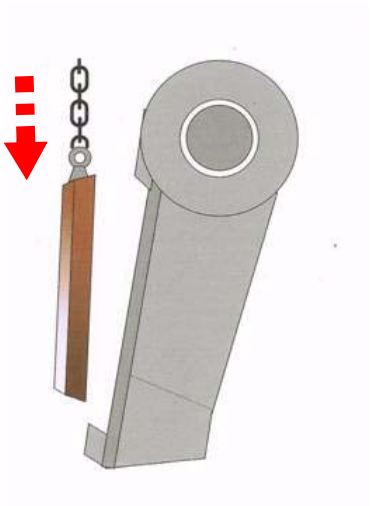
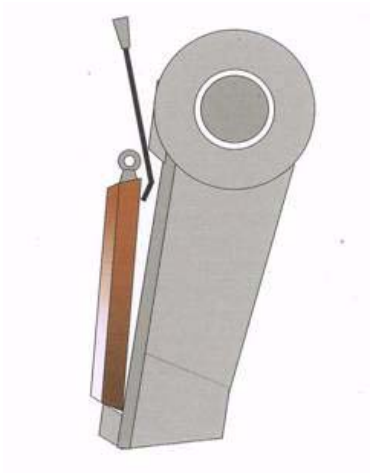
Removal:

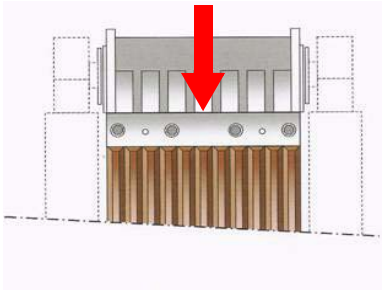
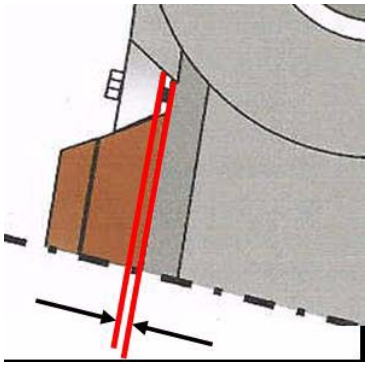
<table>
<tr><td colspan="3"> 
0000187</td></tr>
<tr><td>1</td><td> 
0000193</td><td>Remove screws from clamping claw

Note:
Clamping claws can be one-piece or two-piece, de--pending on design!</td></tr>
<tr><td>2</td><td> 
0000194</td><td>Screw bolts into pressure holes and press in the clamping jaw

Note:
There are two or four pressure holes, depending on design!</td></tr>
</table>

3	 *0000195*	**Tilt the crushing jaws slightly and affix (fasten) the mounting lugs** **Risk of crushing jaw tipping!**
4	 *0000196*	**Move crushing jaw out with hoisting unit**
5	**Turn the crushing jaw or prepare new crushing jaw**	
6	**Clean the bearing surface**	

7	 *0000196*	**Affix the mounting lug** **Carefully move crushing jaw in with hoisting unit** **Ensure that the crushing jaw is centrally positioned on the rocker**
8	 *0000195*	**Tilt crushing jaws slightly and remove mounting lugs** **Risk of crushing jaw tipping!**

9	 *0000193*	**Mount clamping claw**
10	 *0000197*	**Check that there is a gap between clamping claw and bearing surface.** **If no gap is present, the crushing jaws will not be clamped.**

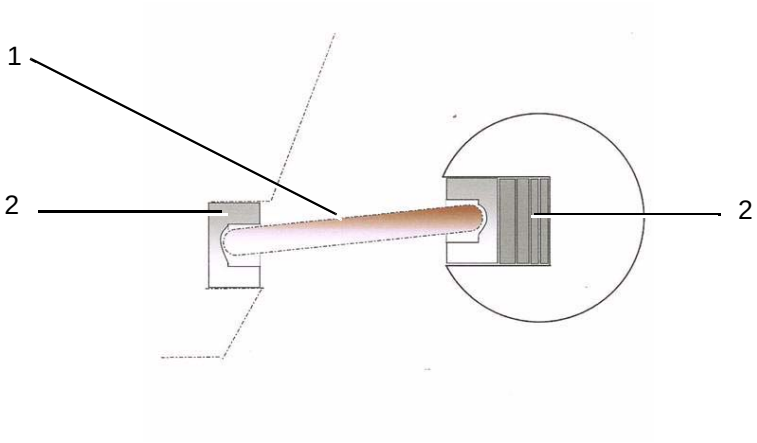
NOTE!

After 10 h full operation, retighten the mounting screws of the clamping claw.

7.5.5 Changing the pressure plate and the pressure plate bearing

IMPORTANT!

Set gap width to maximum.



0000198

Pressure plate

- Attach pressure plate (1) to suitable hoisting unit
- Pull the rocker forward with the drawing spindle
- Remove the pressure plate upwards with the hoisting unit
- Insert new pressure plate into pressure plate bearing (2) from above
- Slowly return the rocker until it reaches the system with the pressure plate

Pressure plate bearing

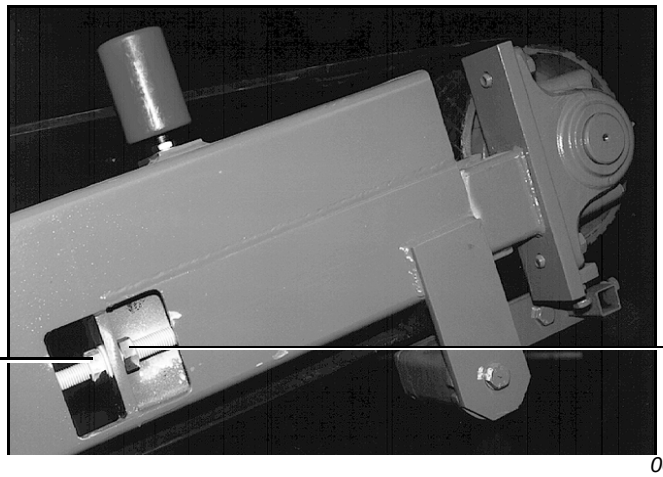
IMPORTANT!

Replace damaged or worn pressure plate bearings.

7.6 Belt conveyor

7.6.1 Tension the belts

The belts are tensioned by means of tensioning spindles. Each belt is provided with two spindles.



0000132

Brass nuts serve for adjustment:

front => clamping nut (1)

rear => lock nut (2)

Tensioning

- Loosen lock nut (slacken until tensioning path is clear)
- Turn the clamping nut until the belt is tensioned

IMPORTANT!

Evenly adjust both tensioning spindles alternately, so that the drive pul-- ley remains at right angles to the frame.

Otherwise the belt will run skew.

Do not tension the belt too firmly.

- Tighten the lock nut
- Belt tensioning note:
  Excessively strong or weak belt tensioning

  - too weak:
  Belt will hang down between the carrier rollers

  - too strong:
  Vibration of the bottom strand

Slacken off

- Loosen lock nut
- Turn the clamping nut until the belt has been slackened sufficiently.

IMPORTANT!

Evenly adjust both tensioning spindles alternately, so that the drive pulley remains at right angles to the frame.

Otherwise the belt will run skew.

- Tighten the lock nut

7.6.2 Changing the belts

In principle there are two different options for changing the belts:

a. Joining of sectioned belt to machine by vulcaniser.
b. Fit endless belt. In the case of endless belts, the conveyor belts must be removed and partially dismantled.

7.6.3 Replacing the scrapers

- Switch off the machine and lock the main switch

Front scraper

Replace plastic strips if necessary

Wedge scraper

Replace plastic strips if necessary

7.6.4 Adjust the belt running

Check the belt running with and without load and adjust if necessary.

⚠ WARNING!

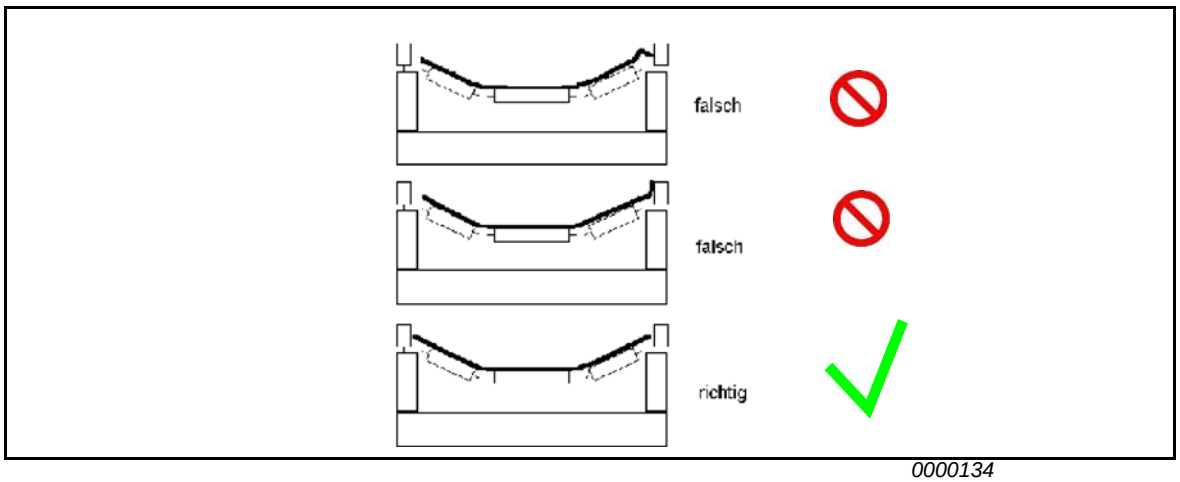
Risk of being pulled in!

When performing checks and adjustments on the running belt there is a risk of being pulled in by the drive pulleys and reverse drums as well as all carrier and bottom belt rollers. Limbs can be torn out.

- **Maintain an adequate safety distance when performing visual checks**
- **Only perform adjustments when the belt is stationary**

Checks

- Check straight-line motion with and without load and adjust if necessary



0000134

- Belt may be positioned on side guide rollers. There must not be any wrinkling or ropiness!

Reasons for defective belt running

- Inadequate alignment of drive pulleys and reverse drums
- Drums or rollers encrusted with dirt on one side
- Feed and guidance of the conveyed material outside the centre of the belt
- Scrapers positioned skew in the flow delivering the conveyed material over the edge of the belt
- Rubbing of the belt on the supporting structure or on jammed items of conveyed material
- Uneven frictional contact over the belt width due to rain or snow
- Incorrectly executed endless connection of the belt with longitudinal kinking

Adjustment

- Align the drive pulley via the tensioning spindles if necessary
- Adjust the belt tension

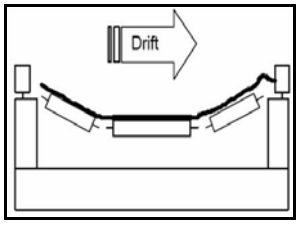
If the defective belt running is due to reasons other than those cited above, then adjust the straight-line motion via the bottom belt rollers

Adjust one or more bottom belt rollers at the point where the belt begins to run skew.

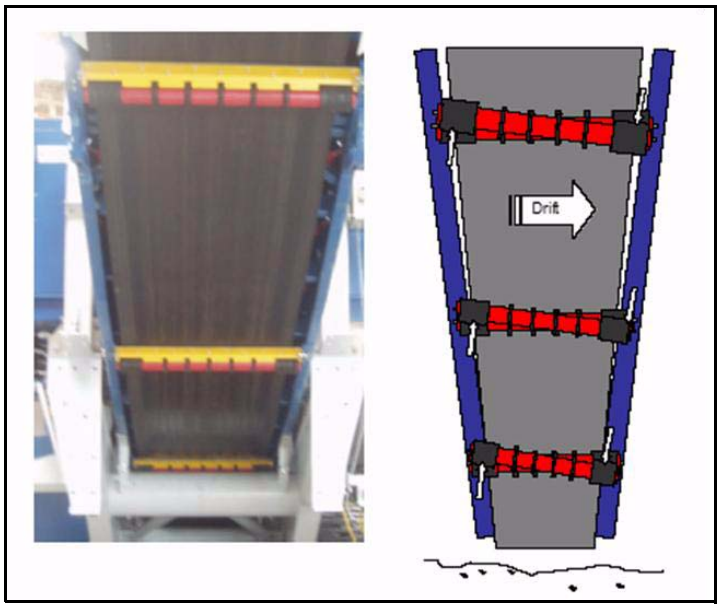
- Loosen the bottom belt roller
- Turn the roller slightly in the slots
- Tighten the bottom belt roller
- No-load test
- Operation at full load

Repeat settings several times if necessary

Example: Drift to the right



0000210



0000199

8 Transport

8.1 Transport between the places of use

If the plant must be driven on public roads, the necessary official permissions for special transport must be obtained. The pertinent regulations must be observed; these differ from country to country.

8.2 Safety information

⚠ WARNING!

Risk of injury and material damage due to incorrect use of hoisting de-- vices and lifting accessories.

Parts may be transported by crane only with suitable cargo gear. Check that chains, ropes etc. are in proper condition.

- **It is forbidden to stand under hovering loads.**
- **Personal protective equipment, such as helmet, safety shoes, gloves etc. must be worn when installing machine.**
- **During installation/removal chains or ropes must be attached to fixed components so they do not slip. Attachment point must be at centre of gravity.**
- **Only qualified and competent personnel must carry out installation/re-- moval work.**

NOTE!

- **Lifting eyes into which the load hooks can be fitted are provided at ma-- chine for transport. Only hook machine to these lifting eyes.**
- **The lifting eyes are only suitable for the weight of the machine. Addi- ti-onal loads added to the machine are not allowed to be lifted using the-se lifting eyes.**
- **In order to avoid endangering persons or damaging the machine, the machine must be transported with caution. In addition to the following information, the general and local regulations on safety and accident prevention must be observed.**
- **Machine may be transported by crane only with suitable cargo gear (in-- spect ropes, chains etc and ensure they are in perfect condition).**
- **It is forbidden to stand under hovering loads.**
- **During transport the statistical load assumptions must be observed in order to avoid deformations and other damage.**

8.3 Retracting the flashing beacon

0000237

- Retract holding tube
  -> Flashing beacon retracts
- Secure position with spring pin

8.3.1 Retracting the supports

0000684

- Set selector switch (1) to "Supports up"
- Start machine
- Supports move up
- Attach the transport securing device

8.4 Disassembling the classifying screen (optional)

⚠ CAUTION!

Material damage!

Machine may tip over due to sagging of soft substructure.

Only position machine on secure and steady substructure.

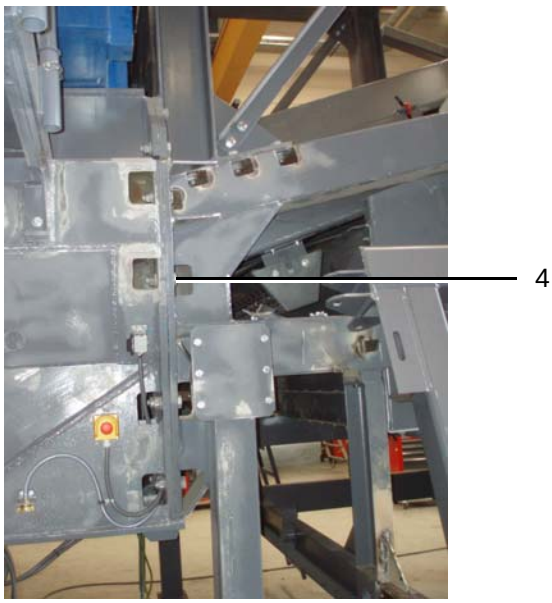
- Secure classifying screen using suitable hoisting gear

0000890

- Attach auxiliary supports (grey) (1)
- Retract hydraulic supporting elements
- Loosen the electrical and hydraulic connections on classifying screen

000891

- Disassemble suspensions (2) on discharge conveyor of classifying screen
- Fold up discharge conveyor of classifying screen and attach transport securing device (3)



0000892

- Remove screw connections (4) between plant and classifying screen
- Carefully move the plant back
- Position the classifying screen horizontally using suitable hoisting gear

0000889

- Attach transport supports (5) to the classifying screen
- Remove auxiliary supports
- Disassemble suspensions (6) on main discharge conveyor of the plant

000891

- Disassemble frame (7) for suspensions
- Fold up main discharge conveyor of the plant and attach transport securing device

8.5 Main discharge conveyor

- Unplug all electrical connections on the belt conveyor

0000884

- Secure conveyor using suitable hoisting gear
- Disassemble conveyor suspensions (1)
- Close ventilation of conveyor drive
- Remove screws from folding point (2)
- Carefully fold down conveyor

0000883

- Attach transport securing device (3)

8.6 Side discharge conveyor

⚠ WARNING!

Risk of injury in area of installation!

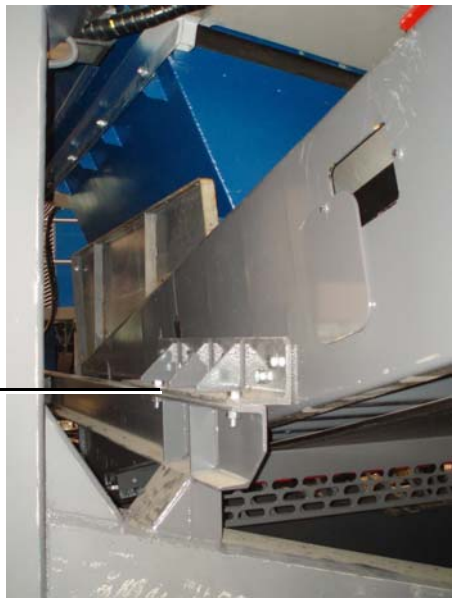
Persons in the installation area of the belt conveyor may be at risk from crushing injuries.

Do not stand in the area of danger when the belt conveyor is being extended.

- Unplug all electrical connections on the belt conveyor
- Attach belt conveyor to appropriate hoisting gear using eyelets provided
- Disassemble suspension (1) between plant and belt conveyor

0000885

- Disassemble frame (2) for suspension
- Disassemble inlet hopper



0000886

- Remove screw connections (3) between plant and belt conveyor
- Extend the belt conveyor using hoisting gear

8.7 Belt conveyor, classifying screen

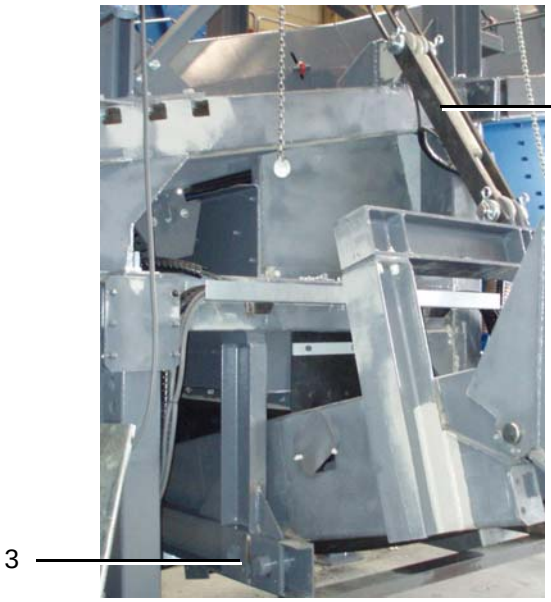
⚠ WARNING!

Risk of injury in area of installation!

Persons in the installation area of the belt conveyor may be at risk from crushing injuries.

Do not stand in the area of danger when the belt conveyor is being extended.

- Unplug all electrical connections on the belt conveyor
- Attach belt conveyor to appropriate hoisting gear using eyelets provided
- Disassemble feed hopper



0000888

- Disassemble cylinder (1)

0000887

- Disassemble suspension (2) between plant and belt conveyor
- Disassemble belt conveyor (3)
- Extend the belt conveyor using hoisting gear

8.8 Platform

- Disassemble the railings
- Disassemble the ladder protections
- Disassemble the platforms

- Unhook the ladders
- Disassemble steps

8.8.1 Disassemble the feed unit

⚠ WARNING!

Risk of injury in the installation area of the feed unit!

Persons standing in the installation area are at risk of injury from trap--ping.

- **Do not stand in the danger zone when dismantling the feed unit.**

⚠ CAUTION!

Damage to property!

Note weight in the feed unit!

- **Only use suitable hoisting gear.**
- **Secure feed unit on several hoisting gears.**

NOTE!

Platforms and screen motor can remain installed

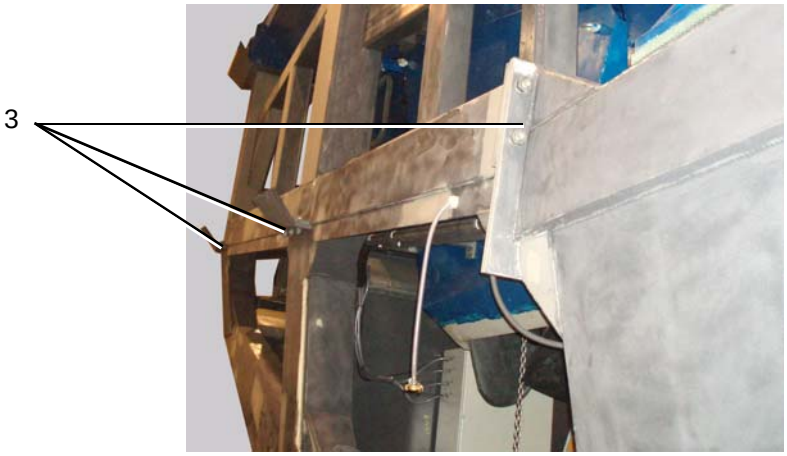
- Plug in electrical connections to the screen and chute

0000668

- Install transport locks on screen and chute (1)

0000690

- Suspend feed unit from suitable hoisting gear by eyelets (2) provided



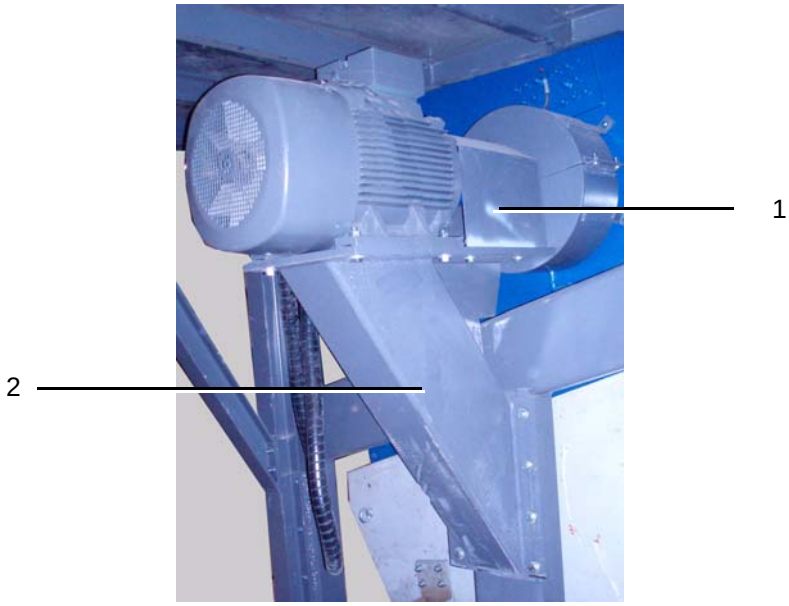
0000693

- Remove screws (3) between feed unit and basic unit
- Lift feed unit carefully from the base unit

0000692

- Secure cross member (4) to suitable hoisting gear and disassemble
- Suspend hopper extension from suitable hoisting gear by eyelets (5) provided
- Remove all bolts (6) between hopper extension and hopper
- Lift hopper extension off the hopper with hoisting gear

8.9 Dismantling the screen drive



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- Disconnect the electrical connections
- Remove cardan shaft protection (1)
- Secure screen drive using suitable hoisting gear
- Remove screws between screen drive and console
- Extend screen drive from the locator on chassis
- Secure the supports using suitable hoisting gear
- Disassemble support (2)

8.9.1 Disassembling crushers

⚠ WARNING!

Risk of injury in the installation area!

Persons in the installation area can be injured by crushing.

- **Do not stand in the danger area during disassembly.**

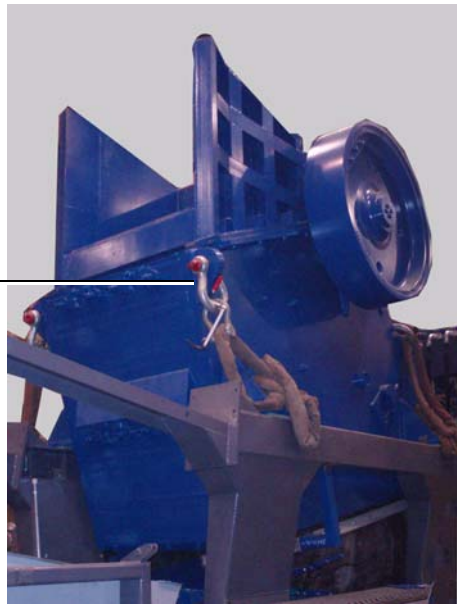
⚠ CAUTION!

Damage to property!

Note weight of the crushers!

Only use suitable hoisting gear.

- Remove belt guard
- Release and remove V-belts (see section Maintenance - Tightening V-belts)
- Loosen hydraulics



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- Suspend crushers from a suitable hoisting gear by the eyelets (1) provided
- Lift crushers carefully from the base unit

8.10 Remove earth connection

- Pull the earth stake out of the ground
- Put the earth stake into the fixture

8.11 Power unit

- Close and secure all service doors

9 Storage

Safety information

NOTE!

- **If possible the machine should be stored in closed rooms until final in-stallation.**
- **If the machine is stored outdoors it must be covered with tarpaulin co-vers that are open at the bottom to allow run off of any condensation.**
- **Machine must be erected on suitable bases to protect against effect of rising damp.**
- **Electrical components must be stored in closed, dry and frost-protec-ted rooms.**
- **A transport and storage period of six months is generally considered as the period beyond which supplementary protective and preserva-ti-on measures must be provided.**

10 Disposal of machine

At the end of its life cycle, the plant must be disposed of in accordance with regulations.

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